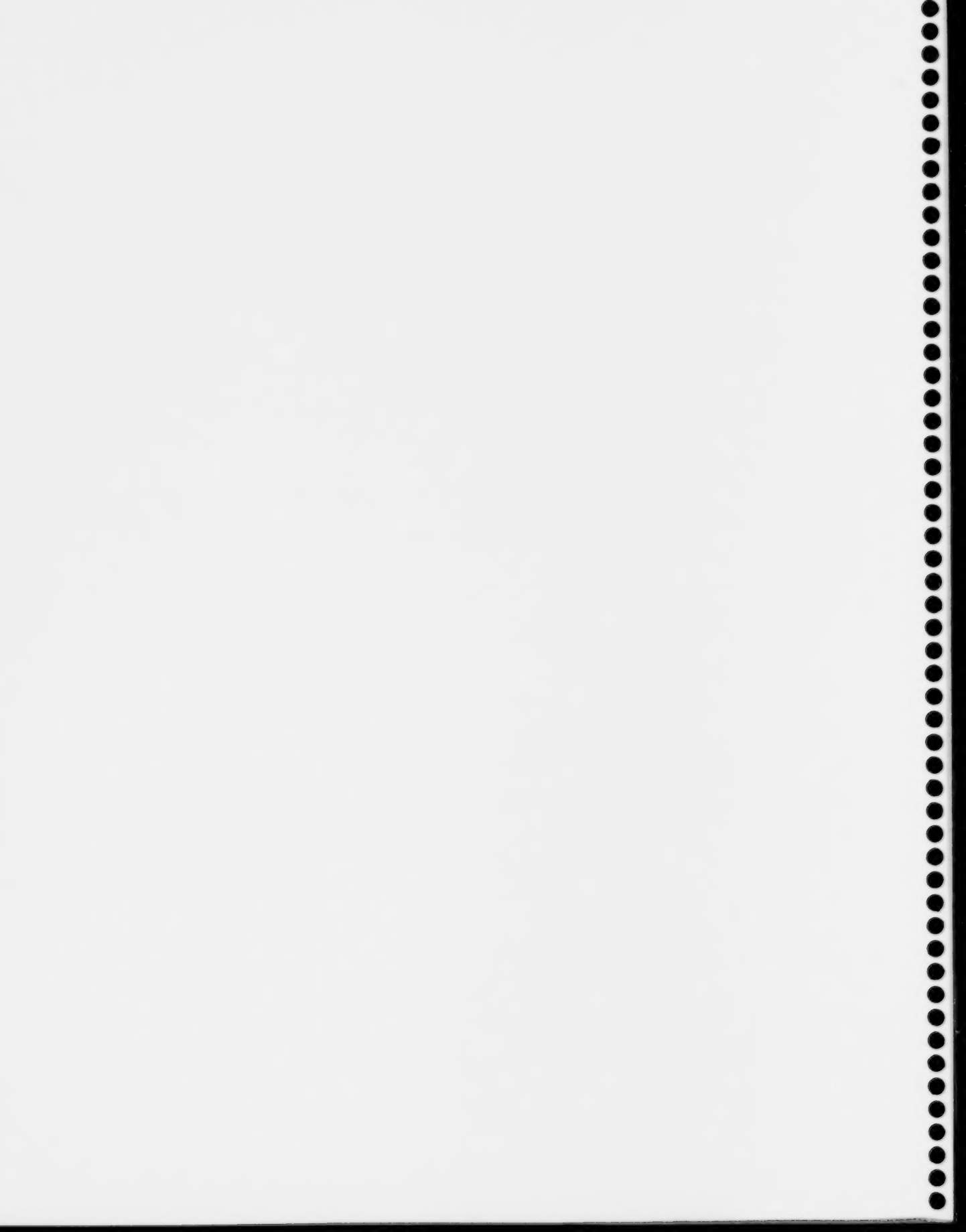




**Ontario Geological Survey  
Open File Report 6124**

**Regional Modern Alluvium  
Sampling of the Kirkland  
Lake–Matachewan Area,  
Northeastern Ontario**

**2005**





ONTARIO GEOLOGICAL SURVEY

Open File Report 6124

Regional Modern Alluvium Sampling of the Kirkland Lake–Matachewan Area,  
Northeastern Ontario

by

D.L. Guindon and J.L. Reid

2005

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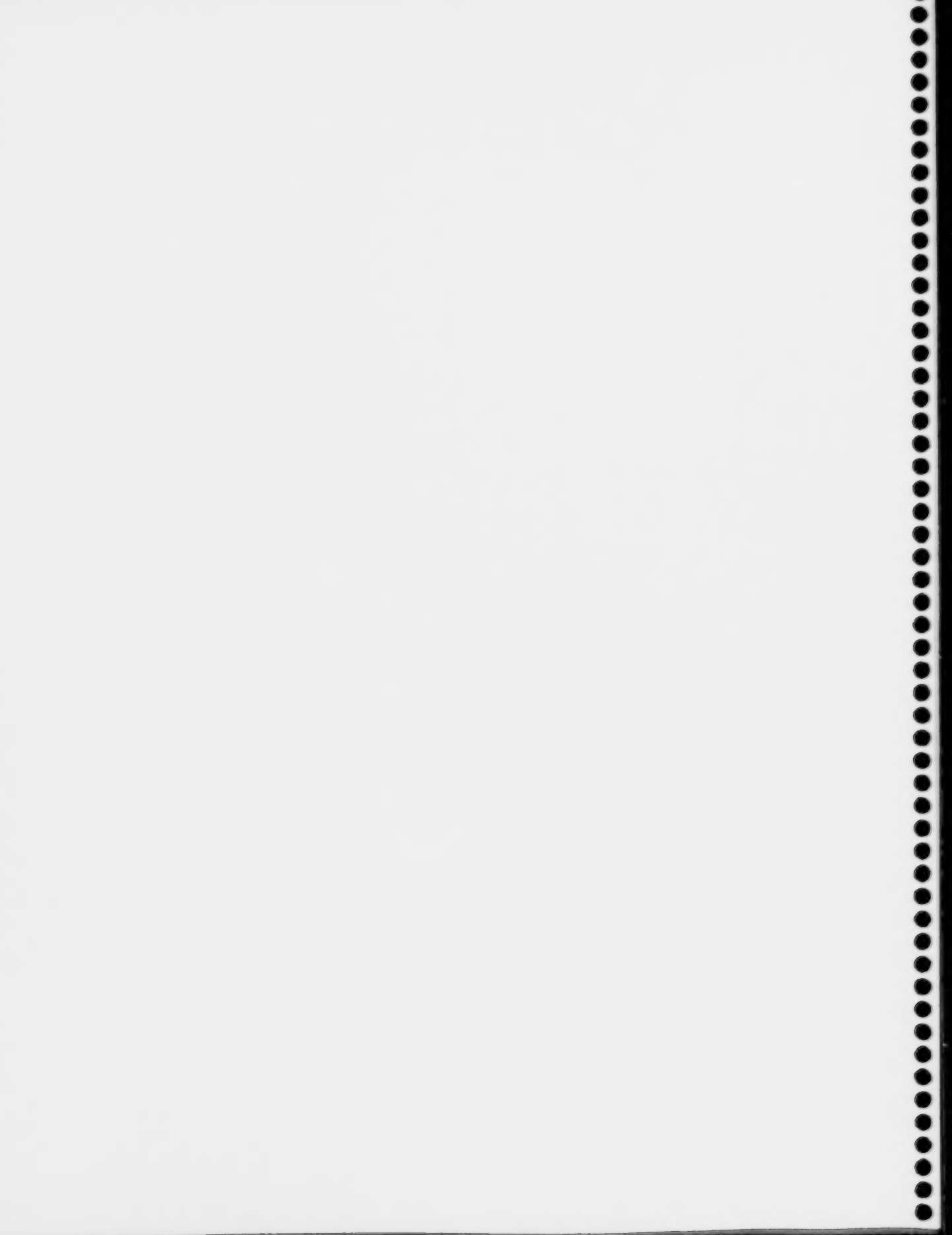




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## Abstract

Between June and August, 2003, the Ontario Geological Survey (OGS) completed a regional modern alluvium sampling survey in the Kirkland Lake–Matachewan region of northeastern Ontario. The primary objective of this survey was to determine the presence of kimberlite indicator minerals (KIMs), metamorphic/magmatic massive sulphide indicator minerals (MMSIMs<sup>2</sup>) and gold grains. The survey area covered approximately 5500 km<sup>2</sup>. A total of 317 modern alluvium, 12 beach deposit, 6 till and 22 glaciofluvial sand and gravel samples were collected.

A number of important indicator minerals were recovered as part of this survey including G10 Cr-pyrope garnets; G9 Cr-pyrope garnets; megacrystic garnets; eclogitic garnets; picro-ilmenites; kimberlitic Cr-diopsides and chromites; and forsteritic olivines. Locations of interest are highlighted in the report including 1) northeast Pacaud Township; 2) eastern Beauchamp Township; 3) 2 areas near Matachewan; and 4) an area near Gowganda.

Mainly reshaped gold grains were recovered at 194 sites. Many of the gold grain anomalies can be related to areas of known gold mineralization, however, there are some that require further follow-up.

A number of metamorphic/magmatic massive sulphide indicator minerals were recovered. Areas that exhibit anomalous distributions of MMSIMs<sup>2</sup> are highlighted in the report.

Digital data are available separately as Miscellaneous Release—Data (MRD) 129. Please note that, in order to keep this report a reasonable size, data for Appendixes B, D, F, G, H and portions of Appendix E (non-DIIF chromite, Cr-diopside, ilmenite and olivine analyses) are only available on MRD 129.

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<sup>2</sup> MMSIM is a registered trademark of Overburden Drilling Management Limited, Nepean, Ontario.



# **Regional Modern Alluvium Sampling of the Kirkland Lake– Matachewan Area, Northeastern Ontario**

**D.L. Guindon<sup>1</sup> and J.L. Reid<sup>2</sup>**  
**Ontario Geological Survey**  
**Open File Report 6124**  
**2005**

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## Introduction

In recent years, the discovery of kimberlites and other rocks (i.e., lamprophyres) thought to have potential to host diamonds in the New Liskeard–Cobalt–Kirkland Lake area of northeastern Ontario has triggered an increase in diamond exploration across the region. The thickness of glacial sediments in this region ranges from nil to greater than 100 m. Kimberlite, being relatively soft, has been differentially eroded by preglacial weathering and glacial erosion such that it subcrops 3 to 35 m below the surrounding bedrock (McClenaghan et al. 1999a). Because of this deep erosion, all kimberlite pipes in the area are covered by glacial sediments and have no surface expression. Other rocks of interest for diamond potential in the region are similarly covered by varying thicknesses of glacial materials. Through indicator mineral and geophysical surveys, several kimberlite pipes and dikes have been discovered in the region within the last 15 years (McClenaghan et al. 1999b).

Indications are that exploration for kimberlite remains very active throughout northeastern Ontario. Over 29 000 new claim units were recorded within the Temagami–Marten River survey area since the release of the Temagami–Marten River indicator mineral report in April 2001 (Allan 2001). Since the release of the Mattawa–Cobalt corridor indicator mineral report in June 2002 (Reid 2002), over 8900 new claim units have been recorded in that area alone. Since the summer of 2002 over 4000 new claim units have been recorded in the New Liskeard–Elk Lake area (V. Felix, OGS, personal communication, 2005).

J.L. Reid left the Ontario Geological Survey in the spring of 2005. Interest in results from the present survey increased following the announcement of the discovery of the Lapointe kimberlite pipe in Sharpe Township. D.L. Guindon was seconded to complete the report and is responsible for the interpretation of the results.

## Background and Current Study

Kimberlite is a rock type commonly recognized as the primary host for diamond. The suite of kimberlite indicator minerals is known to include pyrope and eclogitic garnets, magnesium ilmenite, chromite, chrome diopside, forsteritic olivine and diamond. The presence of these indicator minerals in modern alluvium samples can be used to determine the potential for and proximity of any diamond-bearing kimberlites in an area. As well, other heavy mineral assemblages including gold grains and metamorphic or magmatic massive sulphide indicator minerals (MMSIMs<sup>1</sup>) may be recovered from collected samples and utilized to assess mineral potential of a region.

To further evaluate the diamond and other mineral potential of the Mattawa to Timmins corridor of northeastern Ontario, the Ontario Geological Survey has completed a series of modern alluvium surveys in the region including 1) the Temagami–Marten River area (Allan 2001); 2) the Mattawa–Cobalt Corridor (Reid 2002); and 3) the Cobalt–Elk Lake area (Reid 2004). The current study, covering the Kirkland Lake–Matachewan region, is an extension of the survey completed in 2002 (Figure 1). The primary objective of the study is to extend the regional information base concerning the types and distribution of kimberlite indicator minerals (KIMs) found in modern alluvium northwestward to the Timmins area.

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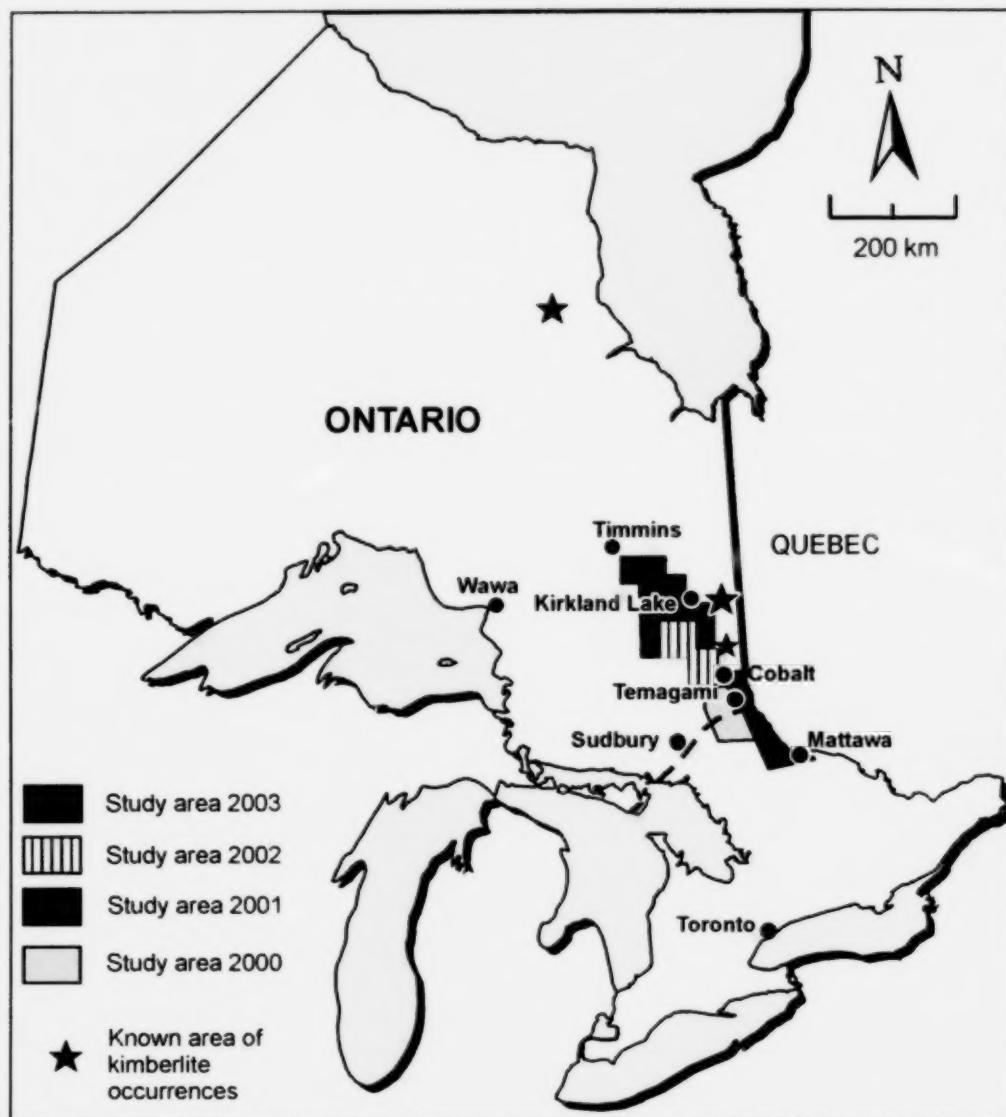


**Figure 1.** Location of the 2003 study area (solid black) and known kimberlites in relation to other KIM areas (*after* Sage 2000).

Previous till sampling surveys carried out within the north-central part of the current study area revealed a spatial pattern of kimberlite indicator mineral occurrences suggesting a local source for kimberlite indicator mineral grains (Bajc and Crabtree 2001). Linear clusters of samples containing indicator minerals were revealed by the till sampling survey and proposed to be associated with structural features present within the survey area (Bajc and Crabtree 2001). Results from the current modern alluvium survey will be used to corroborate and build upon the indicator mineral data generated by previous work and, in addition, add to the overall heavy mineral indicator database for the region.

The Kirkland Lake–Matachewan study area is represented on 12, 1:50 000 scale National Topographic System (NTS) map sheets. The north part of the study area is covered by the Watabeag



River sheet (42A/07), the east half of the Timmins sheet (42A/06), the northeast corner of the Peterlong Lake sheet (42A/03), the Radisson Lake sheet (42A/02), the west half of the Kirkland Lake sheet (42A/01) and the southwest corner of the Ramore sheet (42A/08). The southwest part of the study area is covered by the Matachewan (41P/15) and Gowganda (41P/10) sheets. The southeast part of the study area is covered by the Charlton sheet (41P/16), the west part of the Englehart sheet (31M/13), the northeast corner of the Elk Lake sheet (41P/09) and the northwest corner of the New Liskeard sheet (31M/12).

A network of primary and secondary roads and all-terrain vehicle (ATV) trails provided reasonable access to the study area. The presence of numerous lakes and rivers provided boat access to otherwise remote locations. The larger lakes allowed for floatplane access and very remote sites were accessed by helicopter.

## Physiography

The study area is situated in a physiographic division of the Canadian Shield known as the Abitibi Uplands (Bostock 1976). These uplands are underlain by crystalline Archean rocks and characterized by broad rolling surfaces that rise gently from the Hudson Bay Lowland in the north, reaching about 500 m above sea level (asl) near their southwest and southern extent. Most of the uplands lie between 300 and 400 m asl in elevation. Extensive areas of the northern Abitibi Uplands are mantled by glacial lake deposits. These uplands form a rocky landscape, scattered with lakes and large areas underlain by glacial deposits consisting of glaciolacustrine clays and beach deposits of former proglacial lakes. Other glacial deposits and landforms found in this area include outwash channels, till and moraines (Barnett 1992; Thurston 1991).

The region surrounding Timmins is one of low relief, and a thick mantle of glaciolacustrine clay and silt covers much of the area southeast of Timmins. Variation in local relief rarely exceeds 15 to 23 m, and extensive areas of wet muskeg are common in much of the area south of Timmins. The area to the southeast of Timmins is drained northward, primarily by the Redstone River and Night Hawk Lake (Pyke 1982).

Most of the area near Matachewan has rapid changes in topography with elevation changes of 15 m to 50 m. Large syenite and granite bodies rise above the area while volcanic rocks and diabase dikes form north-trending ridges. Cobalt Group sedimentary rocks provide the highest elevations in the region around Matachewan. The drainage in this region forms a trellis pattern following the north and northwest trends of the main system of joints and faults (Lovell 1967).

The area around Gowganda is one of moderate relief with a maximum of 120 m being attained immediately west of Flatstone Lake where a ridge of Nipissing diabase reaches an elevation of 460 m asl. North-trending hills of similar elevation, formed of Gowganda Formation rocks, occur immediately west of Gowganda. All of the drainage around Gowganda belongs to the north-flowing Montreal River system (McIlwaine 1978).

The southeast region of the study area is partly situated within the Cobalt Plain. The area is composed of clayey and sandy lowlands interrupted by rocky uplands. Much of the area is nearly flat and underlain by glaciolacustrine clay-rich beds that were deposited in glacial Lake Barlow-Ojibway. Elevations range from 180 to 360 m asl. Most uplands are marked by prominent north-trending patterns of narrow valleys that are controlled either by faults, such as the Montreal River fault system, or by joints in the Precambrian bedrock (Roed 1979a). Lakes are common physiographic features of the uplands and almost all shorelines are rocky or bouldery and very irregular. Many of the lakes are connected by

narrow, poorly developed alluvial channels, which are characterized by rapids and low waterfalls, or by small linear ponds or lakes and organic depressions (Roed 1979a).

## Bedrock Geology

The oldest rocks in the study area are Neo- to Mesoarchean (2.5 to 3.4 Ga) in age and belong to the Abitibi Subprovince of the Superior Province. These rock units, located in the southeast corner of the survey area, include granitic rocks of the Round Lake Batholith and intrusive massive granodiorite and foliated tonalite suite rocks (Ontario Geological Survey 1991). Rock units in the northern part of the study area include mafic to intermediate to ultramafic metavolcanic rocks, felsic to intermediate metavolcanic rocks and massive granodiorite to granite. The southwest part of the study area is composed of Huronian Supergroup rocks including the Cobalt Group, foliated tonalite suite, mafic to ultramafic metavolcanic rocks and Nipissing diabase sills and dikes (Figure 2).

The southwestern part of the survey area, around Gowganda, lies near the northwestern edge of the Cobalt Plain of the Southern Structural Province of the Canadian Shield. The exposed Early Precambrian rocks represent inliers in the Middle Precambrian cover with the exception of the metavolcanic assemblage exposed within the Miller Lake diabase basin. The rocks of the area are readily divisible into 4 major units as follows: 1) late gabbroic rocks (Nipissing diabase); 2) Cobalt Group sedimentary rocks; 3) granitic intrusions; and 4) metavolcanic rocks with associated iron formation (McIlwaine 1978). The felsic plutonic rocks exposed in the area represent the extreme southwestern limit of the Round Lake Batholith and are part of a large inlier in the Huronian cover. Two distinct rock types are recognized in this region of the Round Lake Batholith: quartz diorite and albite trondjemite. Late Precambrian quartz diabase and olivine diabase dikes are the youngest rocks in the area.

The central part of the survey area, near Matachewan, comprises rocks of every major division of the Precambrian stratigraphic column for northeastern Ontario. The oldest rocks in the area are Keewatin age volcanic rocks and are overlain by tightly folded Timiskaming age sedimentary rocks. Both are cut by mafic and silicic intrusions. The intrusive rocks were subsequently cut by early diabase dikes. Flat-lying sedimentary rocks of the Gowganda Formation overlie all of the above rocks and are intruded by a few late Nipissing diabase dikes (Lovell 1967).

The northern part of the study area is underlain largely by Archean age supracrustal rocks. These rocks include the Bartlett, Peterlong, Bowman, Geikie and Watabeag assemblages (Jackson and Fyon 1991). Three compositional classes of metavolcanic rocks have been recognized. These include 1) a calc-alkalic suite; 2) a tholeiitic suite, which includes Fe-rich and Mg-rich end members; and 3) a komatiitic suite. Large batholiths and stocks of felsic-intermediate composition intrude the supracrustal rocks. The most notable of these include the Watabeag Batholith, which is located in the northeastern part of the survey area, and the much smaller Adams, Blackstock, Geikie and Cairo stocks. Numerous syenitic intrusions and dikes, such as the Cairo Stock, occur throughout this northern part of the survey area. A north-trending succession of Proterozoic metasedimentary rocks occurs along the northeastern edge of the survey area. These rocks belong to the Huronian Supergroup and consist of relatively flat-lying mudstones, wackes and conglomerates of the Gowganda Formation (Cobalt Group) (Ontario Geological Survey 1991).

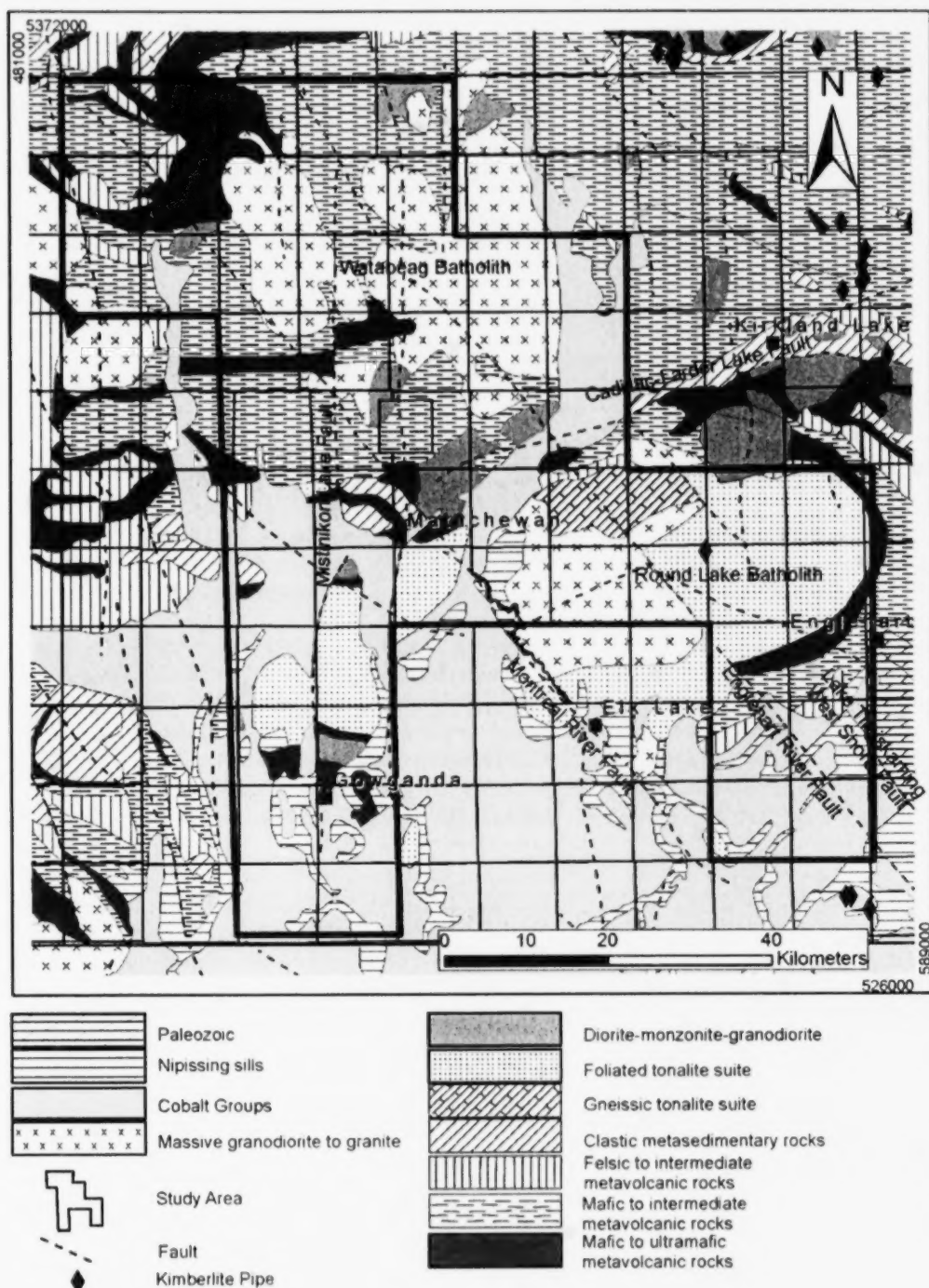


Figure 2. Location and general bedrock geology of the study area (after Ontario Geological Survey 1991).

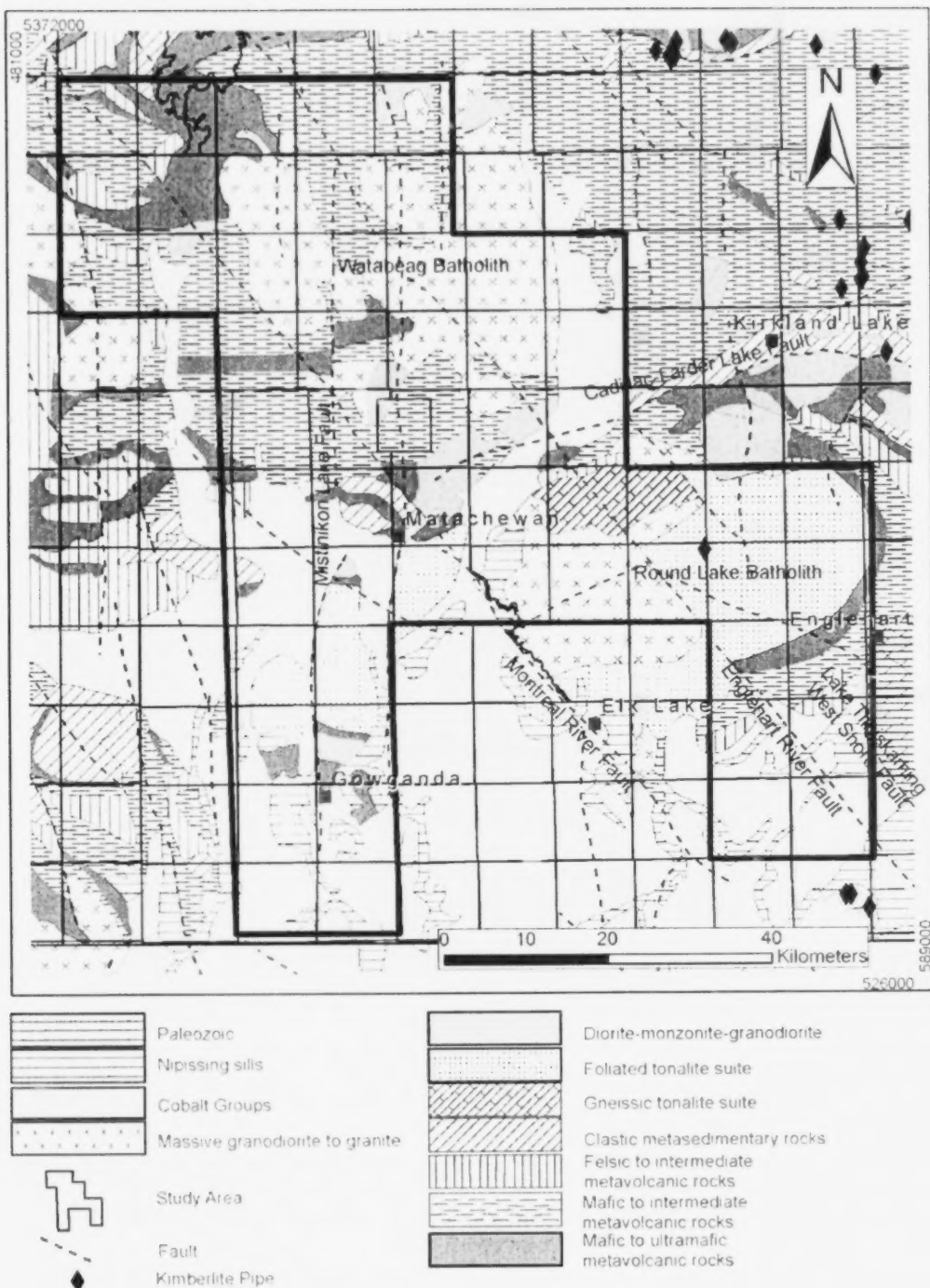


**Figure 2.** Location and general bedrock geology of the study area (after Ontario Geological Survey 1991).

The southeastern part of the study area comprises rocks of the Round Lake Batholith, the Skead Assemblage and the conglomerates, wackes and mudstones of the Cobalt Group. The Round Lake Batholith is a 40 by 80 km, elliptical, east-northeast-trending body. The batholith consists of 2 main phases: 1) an older, foliated to gneissic, hornblende-biotite tonalite-granodiorite phase; and 2) a younger weakly to unfoliated granodiorite-tonalite phase with quartz monzodiorite affinities. The Skead Assemblage wraps around the eastern and southern margins of the Round Lake Batholith. The Skead Assemblage is composed predominantly of calc-alkalic, felsic to intermediate metavolcanic rocks (Jackson and Fyon 1991).

Faults and joints in the bedrock are numerous and the presence of many faults is evident in the terrain. Parallel, northwest-trending fault systems are the most prominent ones in the study area and include the Cross Lake and Montreal River faults (Roed 1979a).

## Economic Geology

Past-producing mines in the region include 1) the Texmont nickel-copper-platinum group element mine, which occurs in komatiitic rocks of the Bartlett Assemblage along the boundary of Bartlett and Geikie townships (immediately to the southwest of Douglas Township); 2) numerous mines associated with the Matachewan gold camp, including the Young-Davidson and the Matachewan Consolidated mines, which are located in Powell Township (Lovell 1967); and 3) the Ashley Gold Mine in northwestern Bannockburn Township, where gold is contained within quartz veins cutting sheared, highly altered mafic metavolcanic rocks (Bajc et al. 1996). In central Robertson Township, the discovery, by Queenston Mining Inc., of base metal mineralization (copper-zinc) contained within felsic volcanic rocks (Jensen 1992) attests to the volcanogenic massive sulphide potential of the area (Bajc et al. 1996). The western extension of the Cadillac-Larder Lake Fault within the townships of Montrose, Bannockburn and Powell, shows a highly prospective zone for gold mineralization (Jensen 1995). Extender Minerals of Canada Ltd. produced barite from an underground mine in Yarrow Township for over 30 years. The Gowganda area produced a significant amount of silver from cobalt-iron-nickel-arsenide ores intermittently over a 70 year period.

Recent mineral finds in the area include Kimbalda and Mount Keith style nickel-copper mineralization in western Bannockburn Township, which has been followed up by Mustang Minerals Corp. (Meyer et al. 2005). Dianor Resources Inc. completed work on narrow kimberlite dikes in Pacaud Township. Kimberlite indicator minerals recovered from the dikes suggest diamond potential (Dianor Resources Inc., press release, March 2, 2004). Arctic Star Diamond Corp. and Tres-Or Resources Limited announced the discovery of a diamondiferous kimberlite pipe in the northeast corner of Sharpe Township and northwest corner of Savard Township (Arctic Star Diamond Corp., press release, May 19, 2005). Grabowski and Wilson (2005) released the results of a diamond in lamprophyre study that encompasses part of the study area. Four dikes, one in northwest Burt Township, one in central Chamberlain Township, and 2 in northeast Pacaud, contained diamonds.



## Quaternary Geology

During the Wisconsin Episode, the study area was covered by glacial ice of the Laurentide Ice Sheet (Roed 1979a). In general, glacial ice advanced south to southeastward across the study area (Barnett 1992). Ice-flow indicators, such as glacial grooves and striae, chattermarks, roche moutonnees, crag and tail features and glacial flutings in areas of thick, continuous till, have been observed in the area (Bajc and Crabtree 2001). Together, these features indicate a fairly consistent late-glacial pattern of ice flow directed toward the south to southeast. However, the presence of crossing striae record a sequence of ice-flow events that both predate and post-date the main ice-flow event. It has been proposed that 3 different stages of ice-flow direction affected the region (Veillette 1986). The oldest, a west-southwest flow ( $230^{\circ}$  to  $270^{\circ}$ ), and a younger, south-southwest flow ( $180^{\circ}$  to  $220^{\circ}$ ) were overprinted by the latest regional south-southeast ice flow ( $130^{\circ}$  to  $170^{\circ}$ ) (Veillette 1986).

Glacial deposits present to the north and east of the Elk Lake region are thought to be primarily of Late Wisconsinan age (Roed 1979a). Advance of the Laurentide Ice Sheet across the area deposited a discontinuous cover of silty sand till (McClenaghan et al. 1999a). Most upland regions within the survey area are characterized by bare bedrock or a thin discontinuous till cover with isolated pockets of thick till. There are, however, areas where extensive till cover masks the underlying bedrock forming gently undulating ground moraine. Till was deposited primarily by lodgement and/or meltout processes or as ice-marginal debris flow (Bajc and Crabtree 2001).

By approximately 10 000 years ago, the glacial front had receded to the current area of study. Extensive esker and deltaic complexes, kames and kettles and moraines were deposited and may represent a stillstand of the ice sheet (Roed 1979b). All of the eskers in the area are composed essentially of sand, gravel, pebbles and some cobbles (MacKean 1968). Deposits of glaciofluvial and glaciolacustrine sediments occur in structurally controlled valleys throughout the study area, as well as in broad basinal settings. Deposits of eolian sand and peat quite often cap the sediment sequence within these areas. Locally, the bedrock surface is covered by variable thicknesses of sediment that often ranges up to several tens of metres (Figure 3).

Approximately 9500 years ago, the ice front had receded well to the north of the study area. At that time, glacial Lake Barlow joined with Lake Ojibway to form Lake Barlow–Ojibway. Meltwater from the Elk Lake valley emptied into this lake along the western part of the New Liskeard lowland (Roed 1979a). Approximately 8700 years ago, barriers along the Lake Temiskaming valley were breached and Lake Barlow–Ojibway drained in several stages (Roed 1979b; Vincent and Hardy 1979). Thick deposits of fine-grained glaciolacustrine sediments associated with glacial Lake Barlow–Ojibway are found within the southeastern part of the study area.

Recent deposits consist mainly of organic swamp deposits and lake sediments and are found throughout the survey area (Born and Burbidge 1997).

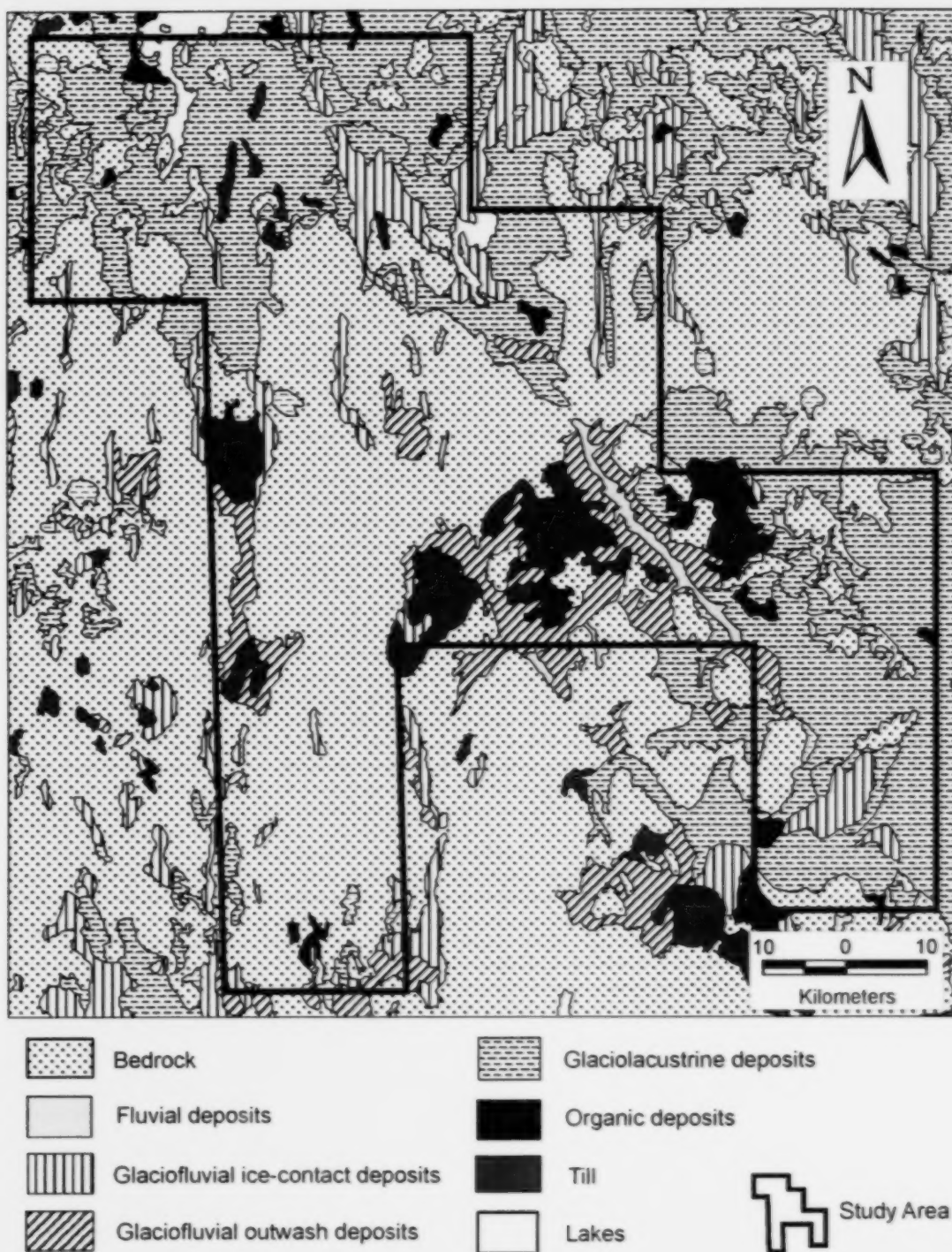


**Figure 3.** Generalized Quaternary geology of the study area (after Barnett et al. 1991).

## Regional Sampling Survey

The current regional modern alluvium survey, covering a total area of approximately 5500 km<sup>2</sup>, was conducted in June, July and August 2003. A total of 317 modern alluvium, 6 till, 22 glaciofluvial sand and gravel and 12 beach deposit samples were collected (Figure 4, back pocket). Access to sample locations was achieved by truck, ATV, boat, float plane and helicopter. The resulting distribution of collected samples provides excellent regional coverage. Regional overburden heavy mineral surveys provide data on the types, distribution and relative concentration of heavy minerals in a given region. The number of samples collected was predetermined by budget and time considerations, however, samples were collected over as broad an area as possible. The position of each sample was accurately recorded with a Geographic Positioning System (GPS) instrument set to North American Datum (NAD) 83 and 27 and using NTS 1:50 000 scale map sheets situated in UTM zone 17. Sample numbers and locations (in UTM coordinates) are summarized in Appendix A (this report and MRD 129).

## Sampling Methodology

The focus of the current sampling program was to provide regional information on kimberlite indicator minerals, MMSIMs and gold grains in the area. The primary objective of regional-scale surveys is to isolate anomalies that may indicate the presence of mineral deposits in the catchment area or possibly beyond. The heavy mineral signature obtained from modern alluvium is a product of the erosion of both bedrock and overburden, and the subsequent transportation and deposition of the eroded material (Morris et al. 2000). Stream sediments are characterized by variable composition, grain size, sorting and colour, all of which are a function of geology, terrain and climate of the catchment area sampled by the stream (Meyer, Theobald and Bloom 1979). It is important to note, however, that lakes within drainage basins act as sediment traps, restricting the down drainage transport of heavy minerals. Therefore, when modern alluvium sample sites were chosen for this survey, an attempt was made to maximize the length of stream section between the sample site and a lake. This maximizes the area of drainage basin sampled by the stream (Morris et al. 2000).

Modern alluvium was chosen as the primary sampling medium for this study as it provides a means of obtaining a fast, relatively inexpensive heavy mineral signature for individual drainage basins (Morris et al. 2000). Points of heavy mineral deposition within streams were targeted for sample collection. Sampling points included the deepest part of the channel; longitudinal and point bars; and boulder, log and vegetation traps (Figure 5) (Morris et al. 2000). Material was sieved in the field using a 5 mm mesh screen and the finer fraction (<5 mm) was retained. Sample weights ranged from 10 to 20 kg. At some sites larger samples were collected to compensate for either a high percentage of fine sand or silt material in the sediment or the dilution of heavy mineral grains caused by a high percentage of organic material. The <5 mm fraction of the sample was sent for heavy mineral processing to separate possible kimberlite and other indicator minerals. Where possible, approximately 50 pebbles were collected from the coarser (>5 mm) fraction at each sample site for pebble lithology classification. Pebble lithologies classified for the study indicate that, in general, stream deposits are locally derived. In addition, at each site a small portion of the stream sediment was panned and the resultant "fine-fraction" concentrate retained.

At each sample location a site description consisting of observations on a) genesis of material, stream flow and depth; b) surface expression; c) slope inclination and aspect; d) drainage; e) vegetation type and state; f) glacial features; and g) anthropogenic factors. Material description consisting of texture; structure; bar form; clast size, abundance, shape and type; and diagrams and additional comments, was completed. Photographs were taken at several sites.





**Figure 5.** Photograph of sample site illustrating boulder traps. Alluvial gravel collects on the downstream side of the boulder, making it ideal for sampling.

## Heavy Mineral Recovery and Identification

All samples were sent to a private laboratory for heavy mineral processing to isolate KIMs, MMSIMs and gold grains. At the laboratory, weighed samples were wet sieved at 2 mm. The >2 mm fraction was stored and the <2 mm fraction was passed over a shaking table to remove light material (low specific gravity) and to obtain a preliminary gold grain count. The table concentrate was panned and a secondary gold grain count performed. Heavy liquid separation (methylene iodide, specific gravity 3.2) was used to further concentrate heavy minerals. The heavy mineral concentrate then underwent ferromagnetic separation to obtain magnetic and nonmagnetic fractions. A series of various sieving and washing processes and additional magnetic separations were carried out to obtain the final concentrates for indicator mineral picking (Figure 6). Sample processing data is presented in Appendix B (see MRD 129). The isolated KIM and MMSIM grains were sent to the Ontario Geoscience Laboratories in Sudbury, Ontario, to determine, through microprobe analysis, the precise composition of critical indicator minerals.

During the picking process 6 types of KIMs were isolated: Cr-pyrope garnets; eclogitic garnets; chromite; Cr-diopside; Mg-ilmenite and forsteritic olivine. All identified grains were sent for microprobe analysis. The picking results and picking remarks for these minerals are outlined in Appendices C and D, respectively (Appendix D is contained in MRD 129). Microprobe analyses for garnets and the diamond inclusion chromites are summarized in Appendix E and MRD 129. All of the microprobe analyses are summarized in MRD 129.

A summary of recovered gold grains is listed in MRD 129, Appendix F. Grains were classified by physical appearance into pristine, modified and reshaped categories (DiLabio 1990). Additionally,

estimated gold concentrations in parts per billion (ppb) were calculated for each category and in total per sample.

Heavy mineral processing also recovered several types of MMSIMs. These include chalcopyrite; pyrite; molybdenite; goethite; spinel (gahnite); corundum; Mn-epidote; Cr-grossular; low Cr-diopside; red rutile; kyanite; staurolite; spessartine; uvarovite; sillimanite; orthopyroxene; fayalite; forsteritic olivine; and chromite. Results are summarized in Appendix I and MRD 129. Only spinel, low Cr-diopside and chromite grains were sent for microprobe analysis and reported in Appendix E (MRD 129).

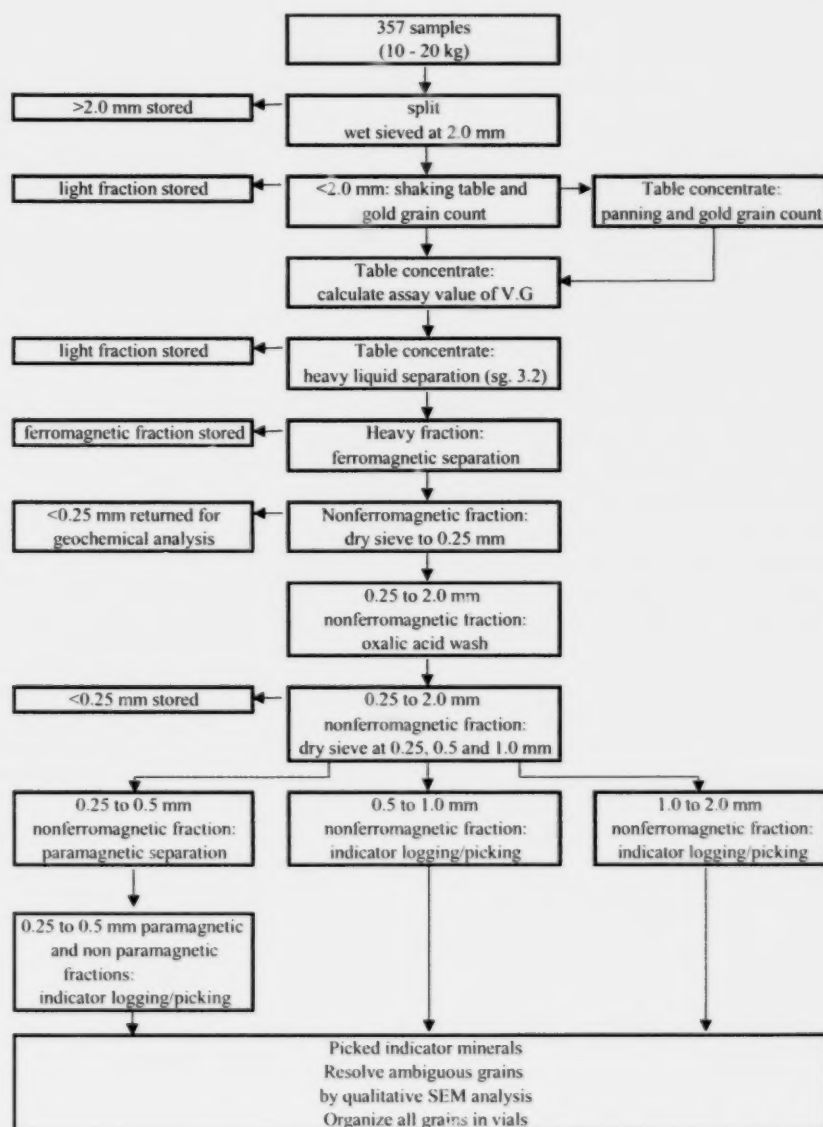


Figure 6. Heavy mineral concentrate process flowchart (after Averill 2001).

## **Pebble Lithology**

Pebble lithology was determined by comparing the physical properties of pebbles to the local bedrock types. Pebble lithology studies provide a useful tool in determining whether the sediment in a stream is derived from a local or distal source. Pebbles similar to the bedrock types in the vicinity of the stream sample location indicate proximity to source. Exotic pebbles, those derived from bedrock located outside of the drainage basin sampled, indicate that transport has occurred over greater distances. In the fluvial (stream) environment, pebble shape may also reflect distance to source. An abundance of angular pebbles suggests local derivation, whereas a population of well-rounded pebbles may indicate longer transport distances. However, the mineralogy of the pebble's rock type must be considered when using this approach, as some easily weathered minerals may be quickly abraded in a stream environment. The resultant pebble may be rounded despite local derivation. Pebble lithologies identified in this survey include felsic and mafic intrusive, gneiss, felsic and mafic metavolcanic, sedimentary, quartz and others. The pebble lithology classification from this survey is summarized in Appendix J.

## **Estimation of Grain Numbers and Data Normalization**

For samples that contain large numbers of indicator minerals, it is neither time efficient nor cost effective to precisely count the absolute number of grains or pick the total number of grains of an abundant mineral present in that sample. Therefore, a representative subset of the grains was picked and an estimate made of the number of grains present. After isolated grains were analyzed by microprobe and their compositions confirmed, picking estimates were normalized based on the number of grains verified to be kimberlitic. For example, sample MA-169 was estimated to contain 1000 chromites, where 46 were picked and sent for microprobe analysis. Analysis revealed that 44 of the 46 chromites were, in fact, kimberlitic. Analysis also revealed one grain to plot within the diamond field. Therefore, after normalization the sample was considered to contain 958 chromites (45 kimberlitic grains divided by 46 total grains times 1000 estimated grains).

Normalization is not recommended except for unusual circumstances where abnormally high numbers of indicator minerals are present and only a select number of grains were picked from an estimated total number of grains (i.e., picked estimate normalization).

All normalized data and sample calculations are listed in Appendix K and MRD 129.

## **Geochemical Analysis, Results and Interpretation**

### **KIMBERLITE INDICATOR MINERALS (KIM)**

Despite the number of potential bedrock settings for natural diamond occurrences, kimberlite has historically been regarded as the only significant primary host rock for diamonds (Helmstaedt 1993). The volcanic host rocks for diamonds, however, merely represent the agents to transport diamonds from the upper mantle to the surface. Kimberlite magmas must form at extreme depths (in excess of 150 km) in order to tap the diamondiferous portions of the sub-cratonic lithosphere. The proven diamond source rocks are various types of peridotite and certain high-pressure eclogites. Three types of peridotitic paragenesis are evident and are listed in order of relative importance with respect to diamond potential: garnet harzburgite; chromite harzburgite; and garnet lherzolite (Gurney 1984). The transportation and

subsequent disaggregation of these source rocks by kimberlite during the eruption process is the mechanism by which both diamonds and associated indicator minerals become liberated from their mantle host rocks.

The indicator mineral approach to kimberlite exploration relies on the recognition of distinctive mineral suites that are associated with potentially diamondiferous source rocks. Since these minerals are far more abundant than coexisting diamonds in the mantle environment and since kimberlite weathers quickly in the secondary environment, exploration programs focus on the recovery of indicator minerals rather than diamonds. The compositions of certain key indicator minerals, namely garnet, chromite, chrome diopside, olivine and ilmenite, have been used in diamond exploration to permit an assessment of diamond potential (Fipke, Gurney and Moore 1995).

## Garnet

Garnet grains analyzed in this study include Cr-pyrope, pyrope, almandine, andradite, spessartine and grossular. Garnets in kimberlites can be derived from various sources, including peridotites, eclogites, Cr-poor megacrysts and crustal rocks. Garnets of peridotite origin are typically Cr-rich pyropes and can originate from 5 different types of peridotite, the 2 most important being harzburgite and lherzolite. Eighty-five percent of Cr-pyrope that occur as inclusions in diamonds are Ca-depleted, Cr-enriched and harzburgitic in origin (Gurney 1984). These types of garnets have been termed "G10" garnets (Dawson and Stephens 1975). Eclogitic and megacrystic garnets are also of primary interest as they are indicative of upper-mantle-derived material. Megacrysts are thought to be phenocrysts in the kimberlite that formed at depths of 150 to 200 km. Therefore, they have no genetic connection with diamonds, which are xenocrysts in the kimberlite, but their presence in a pipe helps in ascertaining if that kimberlite has sampled a sufficiently thick lithospheric mantle keel to be potentially diamondiferous (Schulze 1999; Fipke, Gurney and Moore 1995).

Garnets recovered from modern alluvium sampling in this study were classified on the basis of a combination of geochemical parameters including weight percent (wt %) of  $\text{Cr}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{Na}_2\text{O}$ ,  $\text{FeO}$  and  $\text{CaO}$ . Peridotitic garnets are distinguished from eclogitic and crustal garnets in terms of wt %  $\text{Cr}_2\text{O}_3$ . Eclogitic garnets are typically Cr-poor, whereas harzburgite and lherzolite garnets are Cr-rich, in general, displaying concentrations of  $\text{Cr}_2\text{O}_3$  greater than 2%. These can be further subdivided into G9 and G10 classifications based on  $\text{CaO}$  concentration. On a  $\text{CaO}/\text{Cr}_2\text{O}_3$  plot, 85% of diamond inclusion garnets fall on the Ca-enriched side of a diagonal line that parallels the lherzolite trend. This 'diamond in' line (based on studies of South African diamondiferous kimberlites) separates G10 (Ca-depleted) garnets to the left and G9 garnets to the right. Given that garnet harzburgite has greater diamond potential than garnet lherzolite, G10 garnets with compositions that scatter well across the sub-calcic field are the most important garnet indicators recovered in an exploration program (Gurney and Zweistra 1995). Very high diamond potential is indicated by G10s that are <2.5 wt %  $\text{CaO}$  and >6 wt %  $\text{Cr}_2\text{O}_3$  (Fipke, Gurney and Moore 1995). Additionally, peridotitic garnets can be classified according to a J-factor scale (Lee 1993). On a  $\text{CaO}/\text{Cr}_2\text{O}_3$  plot, the areas defining G9 and G10 garnets have been subdivided into 10 zones that rate diamond potential from J1 to J10, where J10 represents a highly Cr-enriched, Ca-depleted G10 garnet.

Eclogitic garnets have  $\text{Cr}_2\text{O}_3$  concentrations <2 wt % and can be isolated from crustal garnets and Cr-poor megacrysts on the basis of  $\text{FeO}$ ,  $\text{MnO}$  and  $\text{TiO}_2$  content. The first step is to screen out crustal garnets on the basis of  $\text{FeO}$  concentration where the  $\text{FeO}$  content of eclogitic garnets is <22 wt %. Care must be taken to exclude spessartine and grossular garnets from the data, as they will tend to plot with the eclogites at this stage. These grains can be screened on the basis of  $\text{MnO}$  (typically >1%) and  $\text{CaO}$  (typically >15%) (Ontario Geological Survey 2001). After eclogitic garnets have been isolated, the classification of Group I and Group II eclogites and compositional overlap with megacryst garnets can be

carried out using a plot of  $\text{Na}_2\text{O}$  vs.  $\text{TiO}_2$  (Schulze 1999). Generally, only Group I eclogites are considered diamond bearing. Garnets from these eclogites have a content of  $\text{Na}_2\text{O} > 0.07$  wt %, indicating equilibrium at high pressures compatible with diamond stability (Schulze 1999; Fipke, Gurney and Moore 1995). Group II eclogites are Ti and Na depleted. Megacrystic garnets also have  $\text{Na}_2\text{O}$  concentrations of  $< 0.07$  wt %, however, on this particular plot, they are also  $\text{TiO}_2$  enriched, with concentrations of  $\text{TiO}_2 > 0.4$  wt % (Schulze 1999).

A total of 251 garnets were recovered from heavy mineral processing and sent for microprobe analysis. Geochemical classification determined the following distinctions: 2 G10 pyropes; 83 G9 pyropes; 8 Group II eclogitic garnets (ECL); 33 chromium-poor megacrysts; 113 crustal garnets; and 12 non-garnets. Figure 7 shows the distribution of all compositional data on the lherzolite-harzburgite discriminant plot. The J-factor classification of all the G9 and G10 garnets shows that the 2 G10 garnets fall in the J3 field (Figure 8).

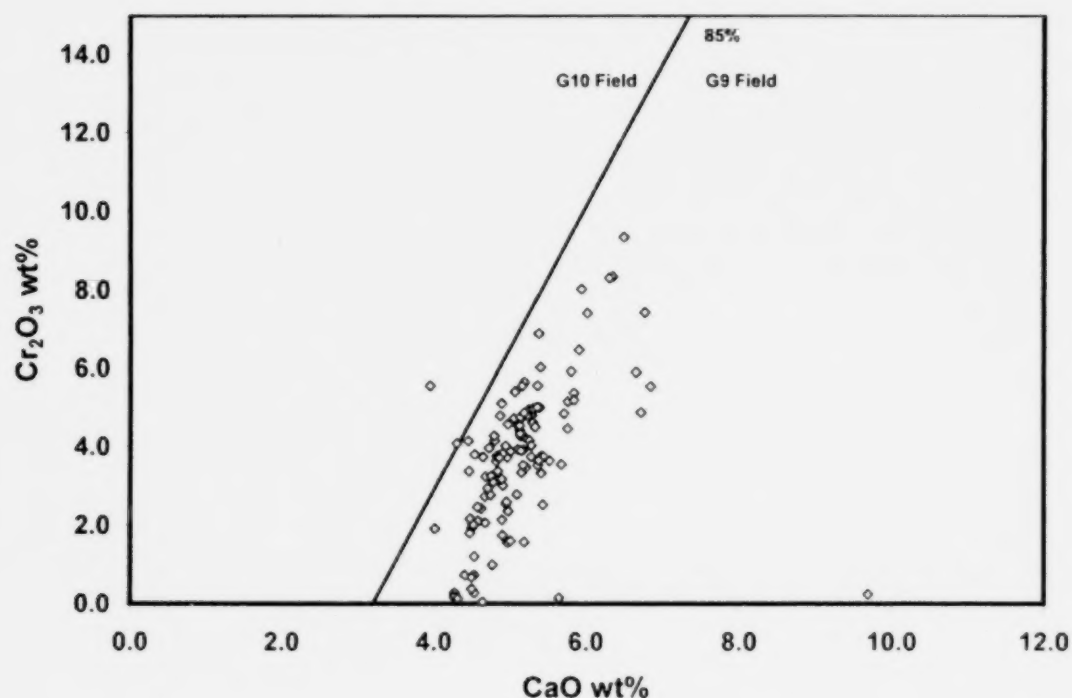


**Figure 7.** CaO versus  $\text{Cr}_2\text{O}_3$  plot of G9 and G10 garnets recovered from the study area (after Dawson and Stephens 1975).

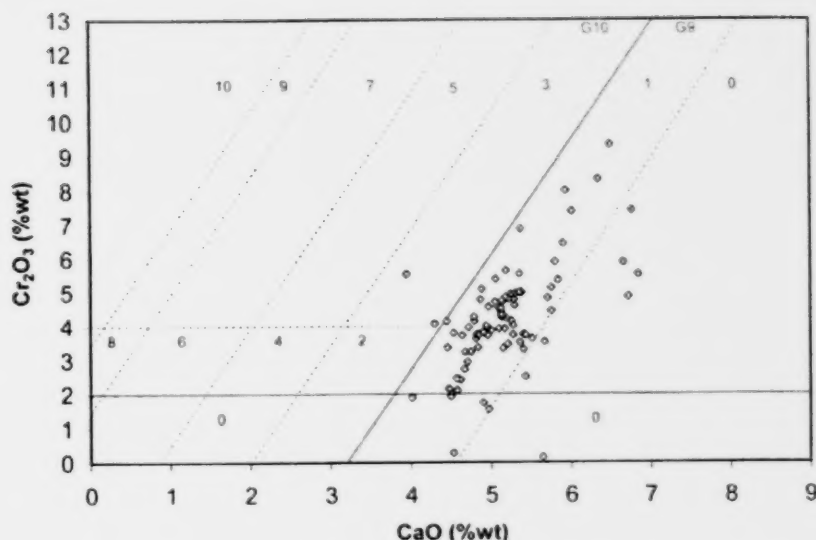


Figure 8. J-factor classification of all G9 and G10 garnets (after Lee 1993).

Chemical compositions of different garnet types are compared on the graphs illustrating the classification process: G9 and megacrystic garnets on a  $\text{Cr}_2\text{O}_3/\text{TiO}_2$  plot (Figure 9); eclogitic and crustal garnets on a  $\text{FeO}/\text{TiO}_2$  plot (Figure 10); Group II eclogitic garnets and megacrysts on a  $\text{Na}_2\text{O}/\text{TiO}_2$  plot (Figure 11); and eclogitic and megacrystic garnets on a  $\text{Na}_2\text{O}/\text{CaO}$  plot (Figure 12). The presence of 8 Group II eclogite garnets suggests that some of the eclogite source rocks sampled may have been diamond bearing. The presence of 2 G10 garnets suggests that the peridotite source was potentially diamond bearing. The KIM garnet signature for the study area is predominately peridotitic in nature as evidenced by the numerous G9 garnet grains recovered. Therefore, it can be inferred that any kimberlites or related rocks that may exist in the region sampled more mantle-derived peridotite than eclogite.

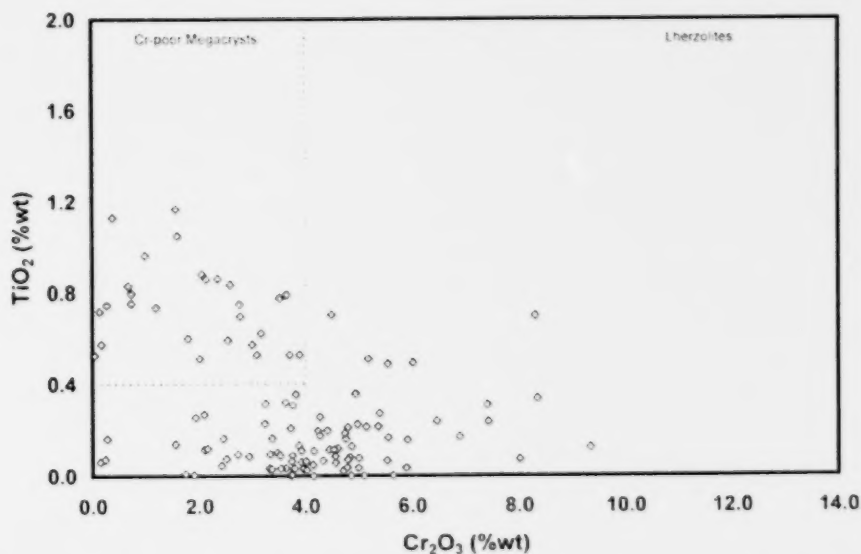


Figure 9.  $\text{Cr}_2\text{O}_3$ - $\text{TiO}_2$  plot showing lherzolitic garnets and chromium-poor megacrysts from the study area (after Schultze 1999).



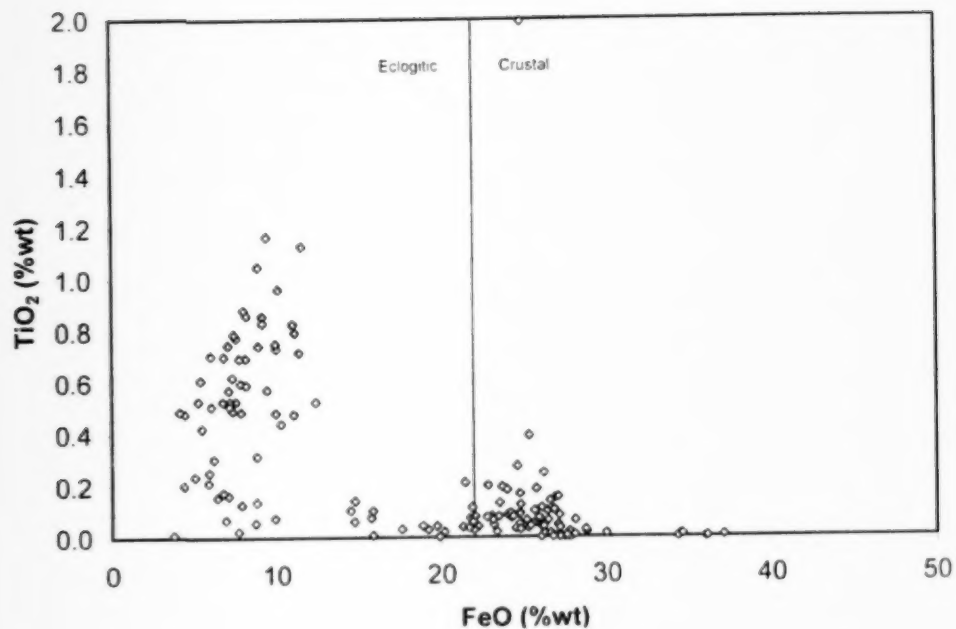


**Figure 10.** FeO-TiO<sub>2</sub> plot showing eclogitic garnets from the study area (*after* Schultze 1999).

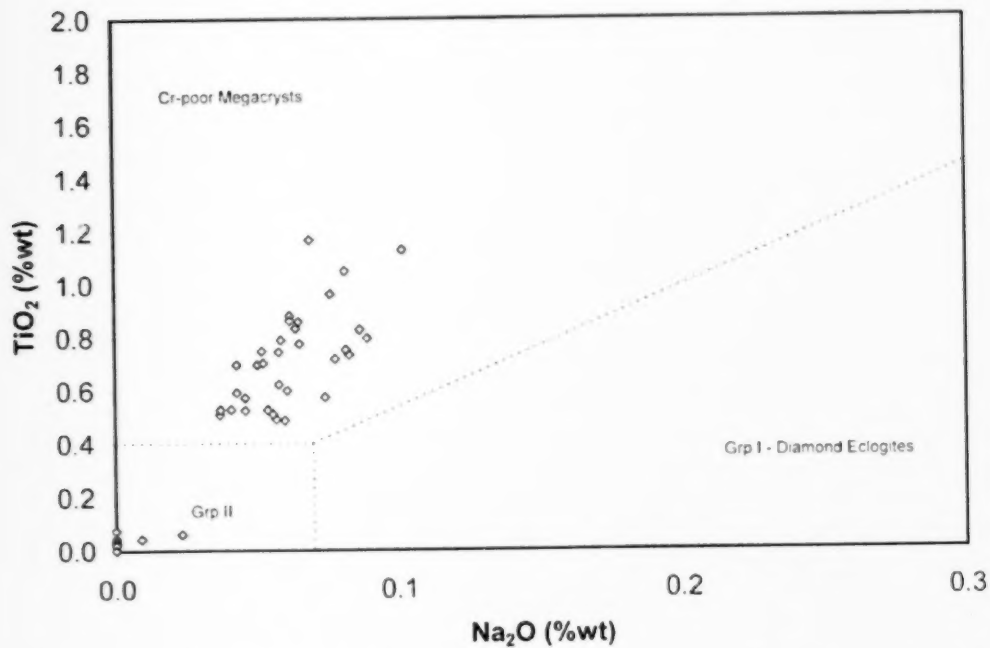


**Figure 11.** Na<sub>2</sub>O-TiO<sub>2</sub> plot showing Group I and II eclogitic garnets and chromium-poor megacrystic garnets from the study area (*after* Schultze 1999).

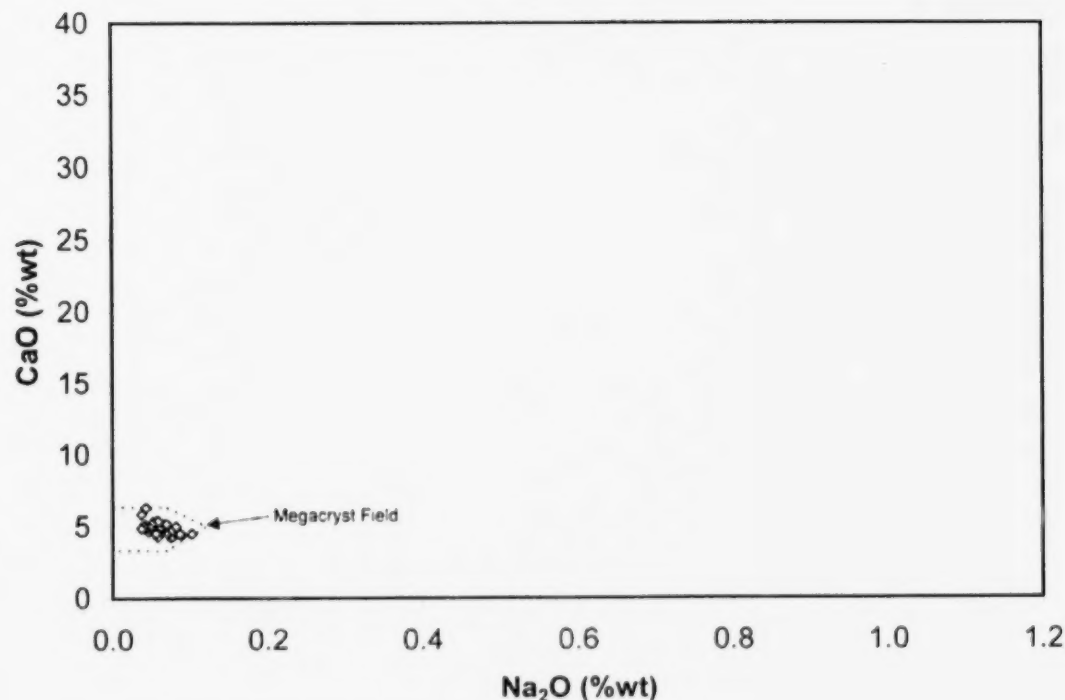


Figure 12. Na<sub>2</sub>O-CaO plot of garnets from the study area and the megacrystic field (after Fipke et al. 1995).

The regional occurrences of G10s, G9s, Group II ECLs and Cr-poor megacrysts are summarized in Figures 13, 14, 15 and 16, respectively. In all the figures, there is a strong spatial relationship with the Lake Timiskaming Structural Zone (Sage 1996, 2000). One of the G10 (sample MA-054), many of the G9 (samples MA-048, MA-052, MA-054), 2 of the Group II eclogitic and many of the megacrystic garnets are located near the northeast corner of the Round Lake Batholith, on the eastern side of Pacaud Township. There are no known kimberlite pipes nearby. However, Dianor Resources Inc. have been exploring kimberlite dikes in the southwest corner of the township. Lamprophyre sampling (Grabowski and Wilson 2005) recovered diamonds from 2 juxtaposed dikes in northeast Pacaud Township. The other G10 garnet (sample MA-240) was recovered in Beauchamp Township where there are no known nearby kimberlite bodies. This sample also contained 9 G9 garnet grains and 1 megacrystic garnet.

A number of garnets were recovered in the vicinity of the Watabeag Batholith in the northeastern part of the survey area. Staking in this area has taken place following the announcement of the discovery of the kimberlite pipe in Sharpe and Savard townships by Arctic Star Diamond Corp. and Tres-Or Resources Limited. Further to the northwest, along the Lake Timiskaming Structural Zone, a megacrystic garnet was recovered in sample BD-009. This is near the site where the Jarvi diamond was recovered during esker sampling in 1971 (Brunner 1978).

Numerous G9, Group II eclogitic and a megacrystic garnets were recovered from samples collected adjacent to the Montreal River Fault in the Matachewan area. This fault is also part of the Lake Timiskaming Structural Zone.



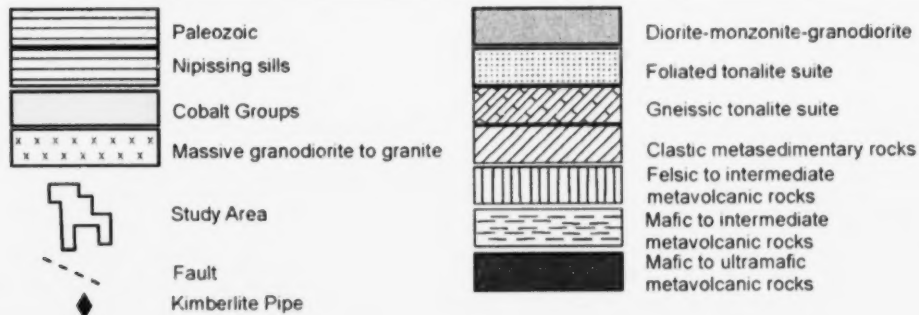
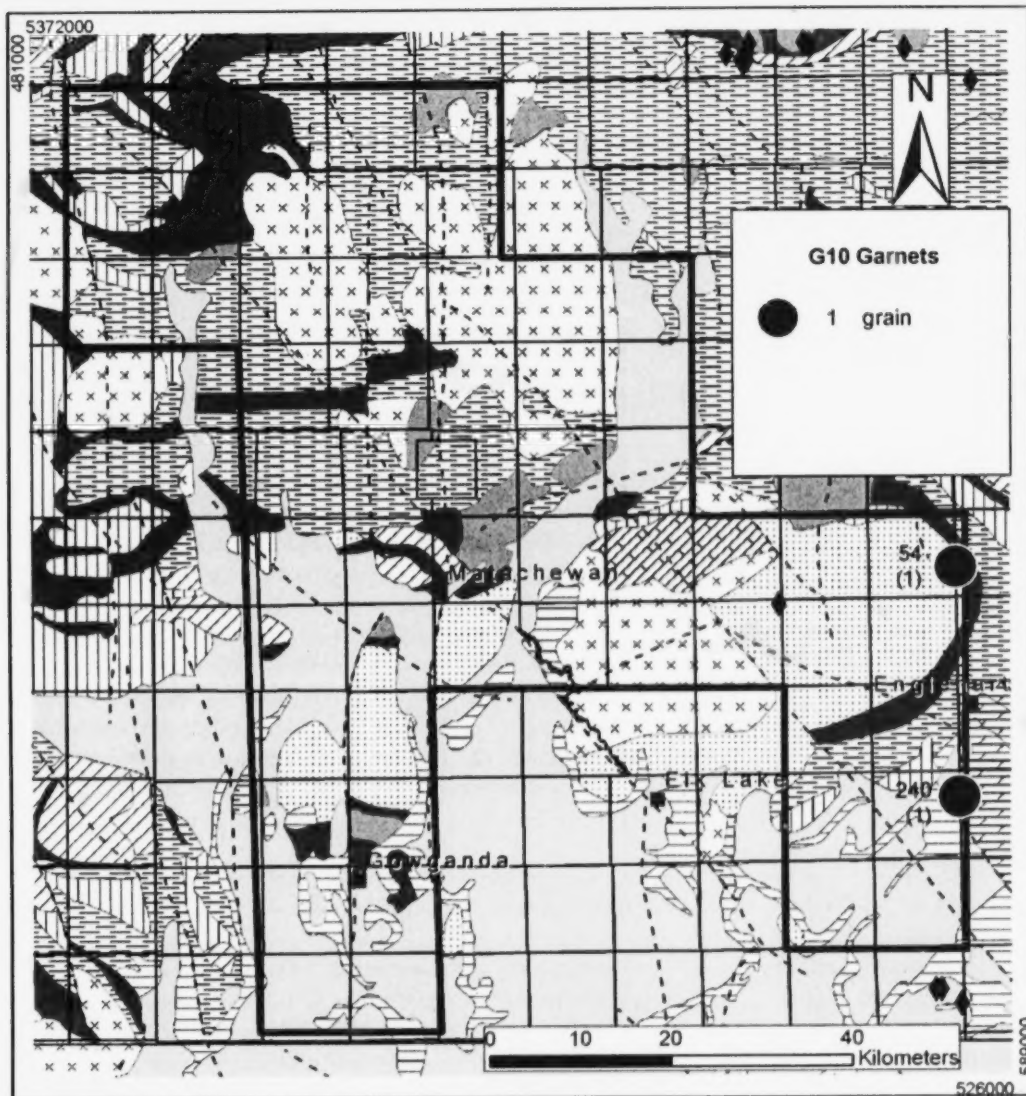


**Figure 13.** Regional distribution of G10 garnet grains. Sites are labelled by sample number (note that the sample number prefix "03-JR-MA-0" has been omitted from the figures for clarity) with corresponding number of grains shown in brackets.

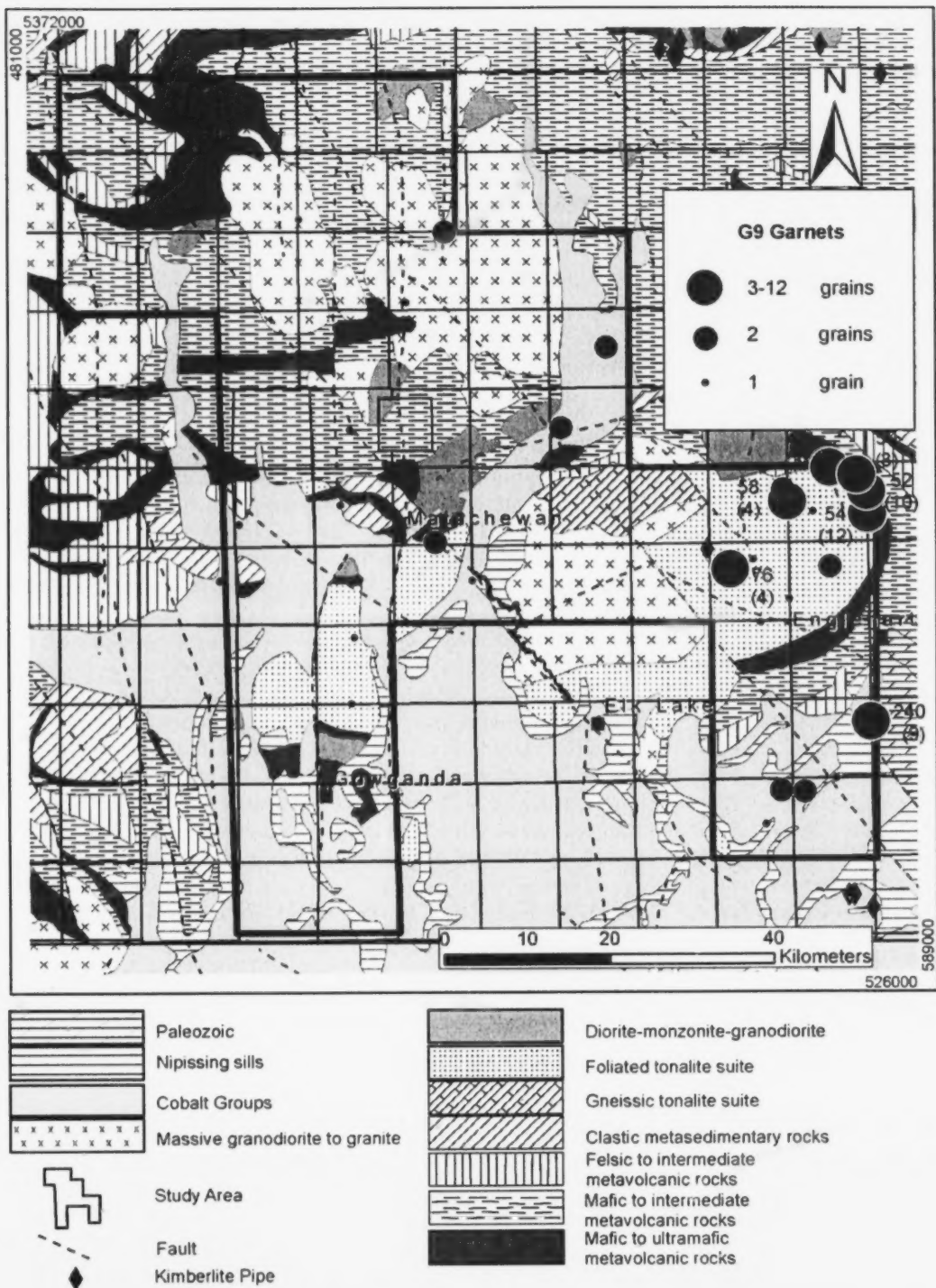


**Figure 14.** Regional distribution of G9 garnet grains. Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.

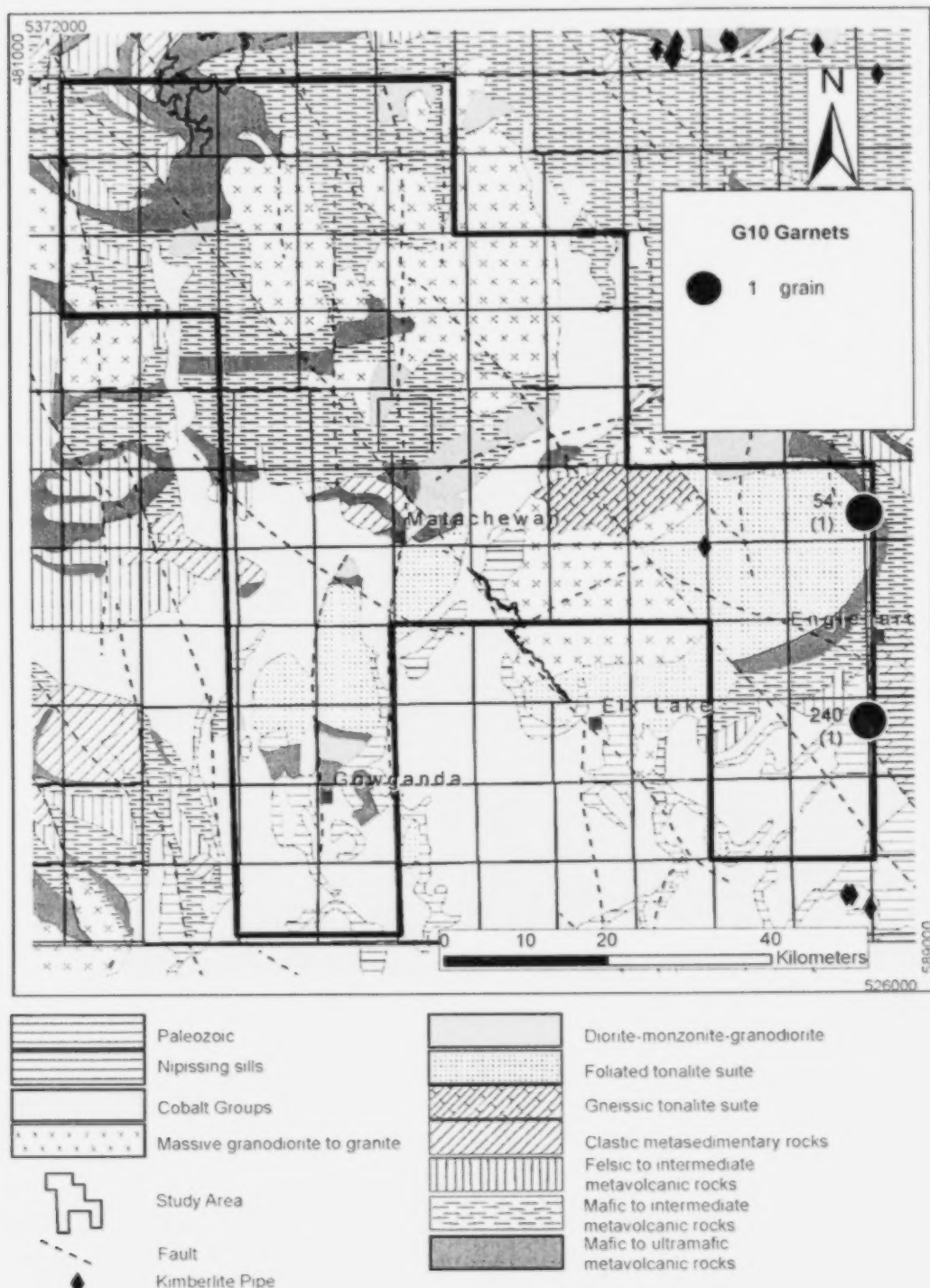


**Figure 13.** Regional distribution of G10 garnet grains. Sites are labelled by sample number (note that the sample number prefix "03-JR-MA-0" has been omitted from the figures for clarity) with corresponding number of grains shown in brackets.

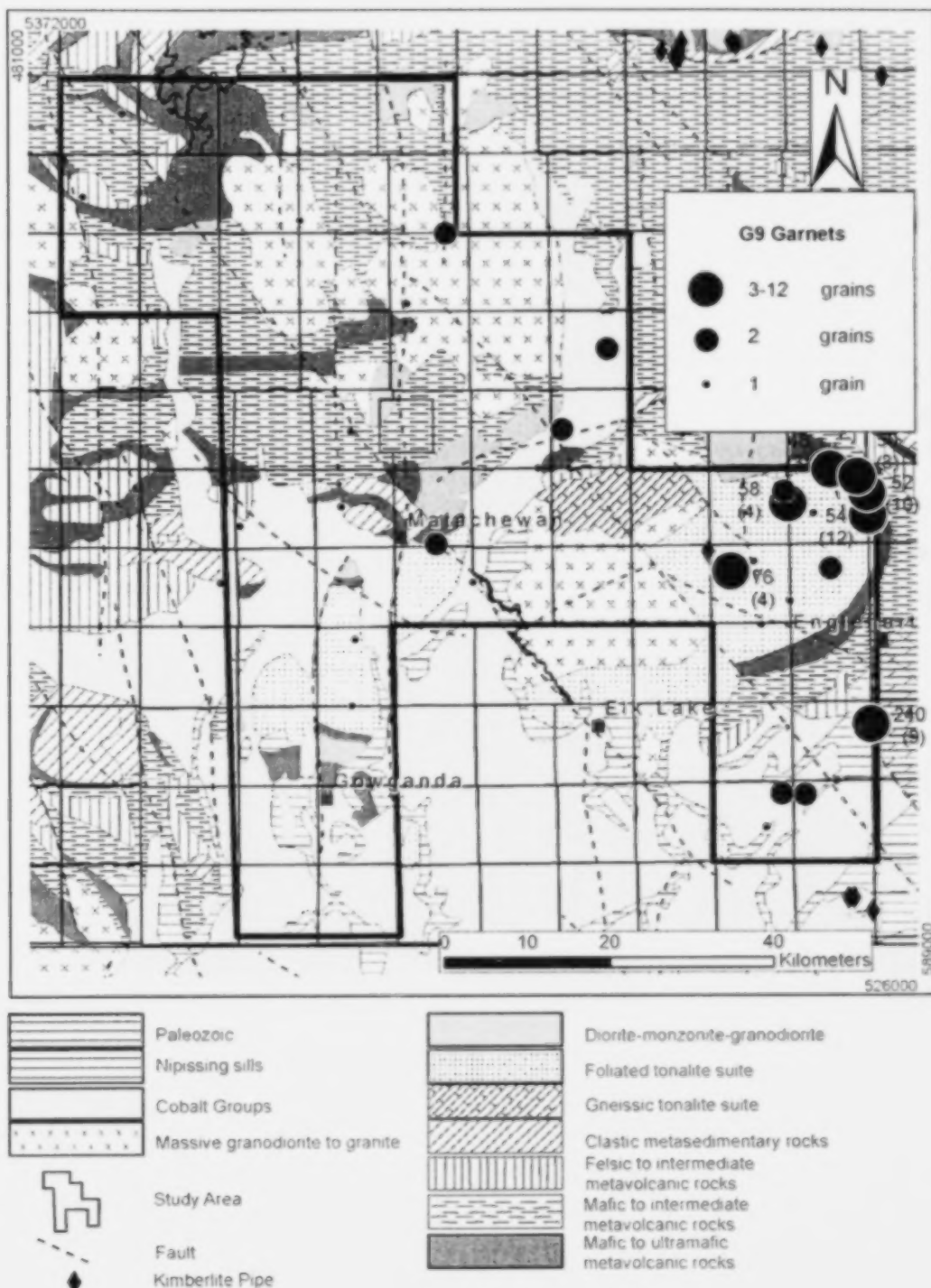


Figure 14. Regional distribution of G9 garnet grains. Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.

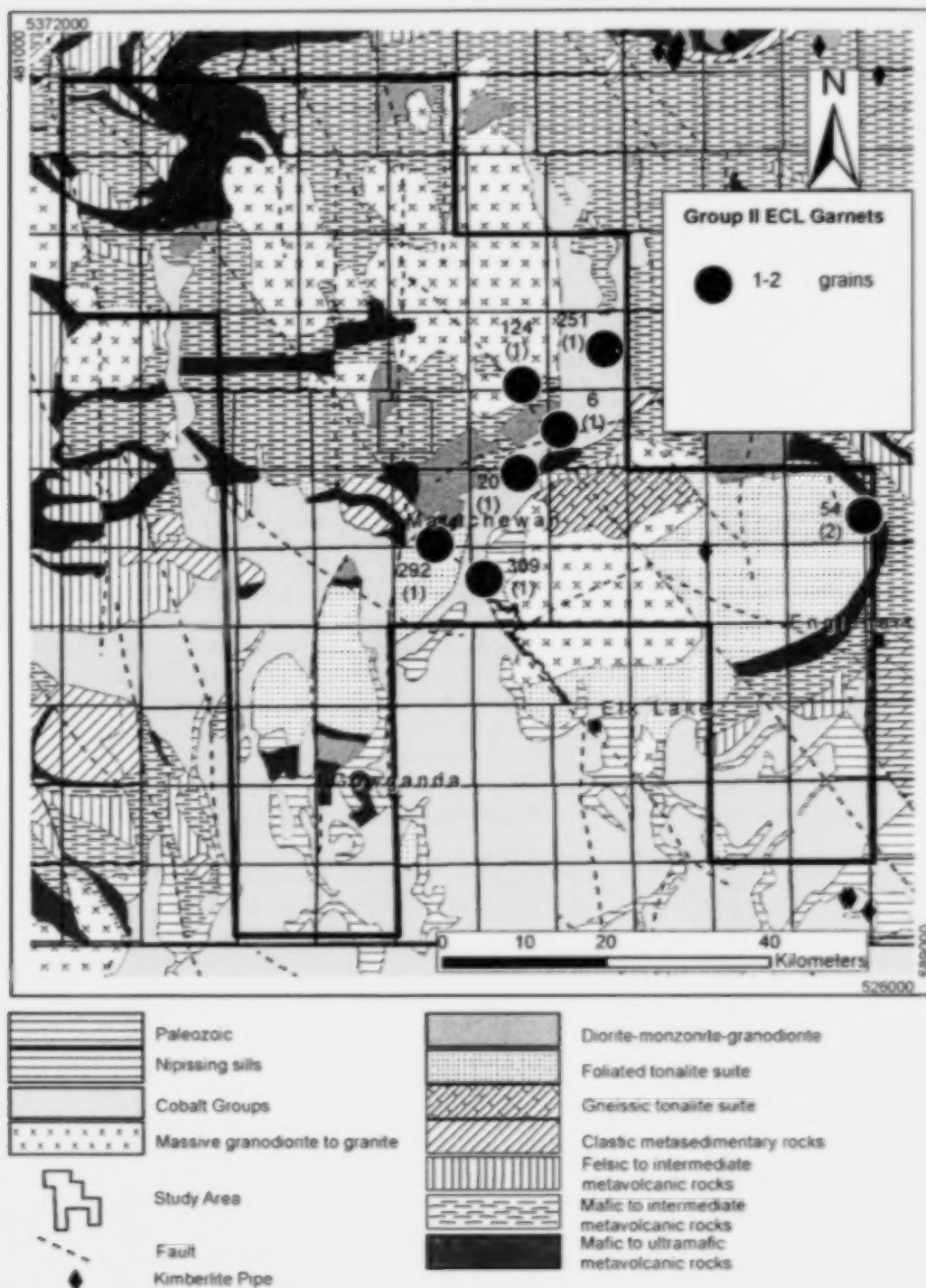


**Figure 15.** Regional distribution of Group II eclogitic garnet grains. Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.



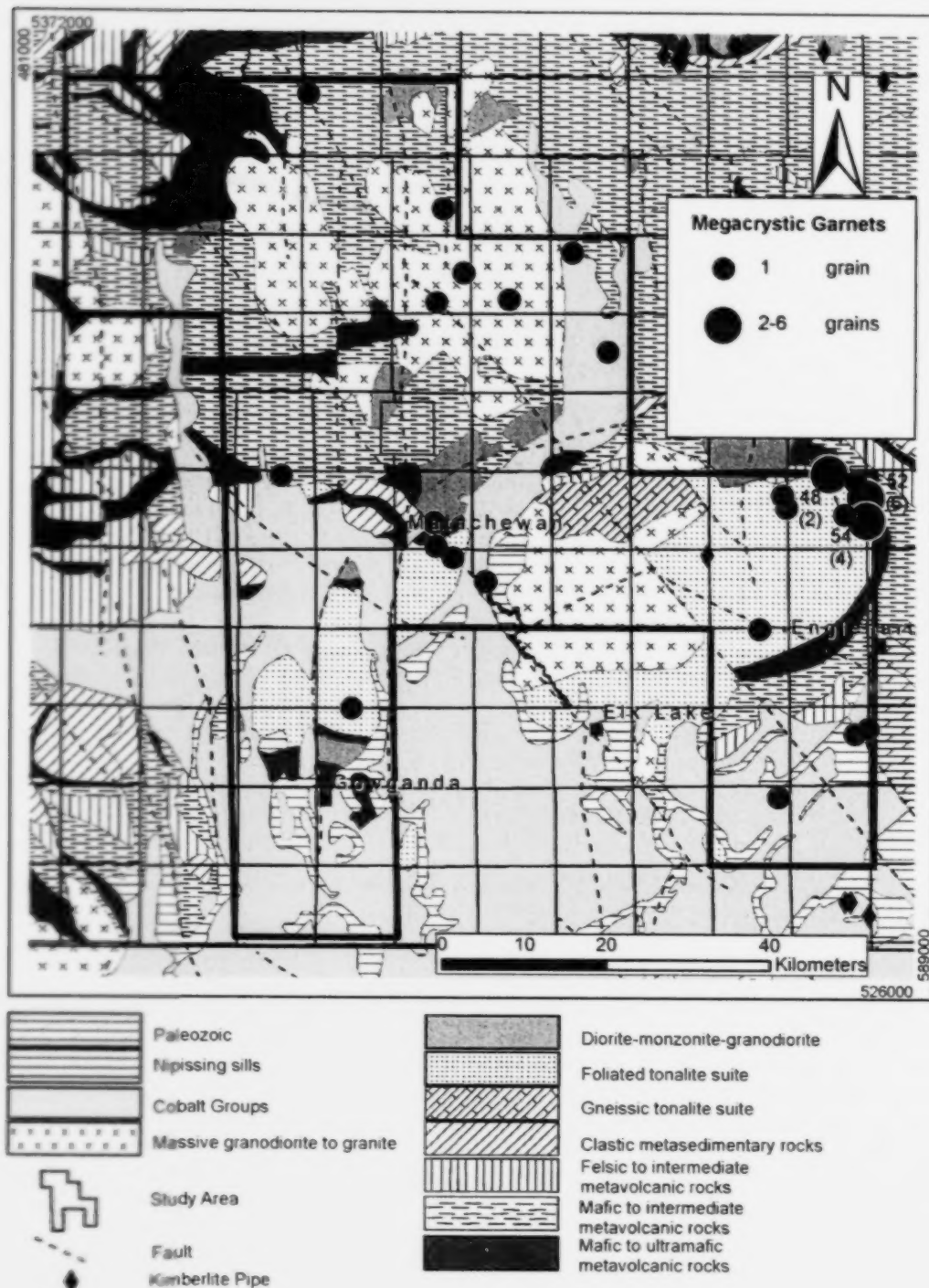


Figure 16. Regional distribution of chromium-poor megacrystic garnet grains. Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.

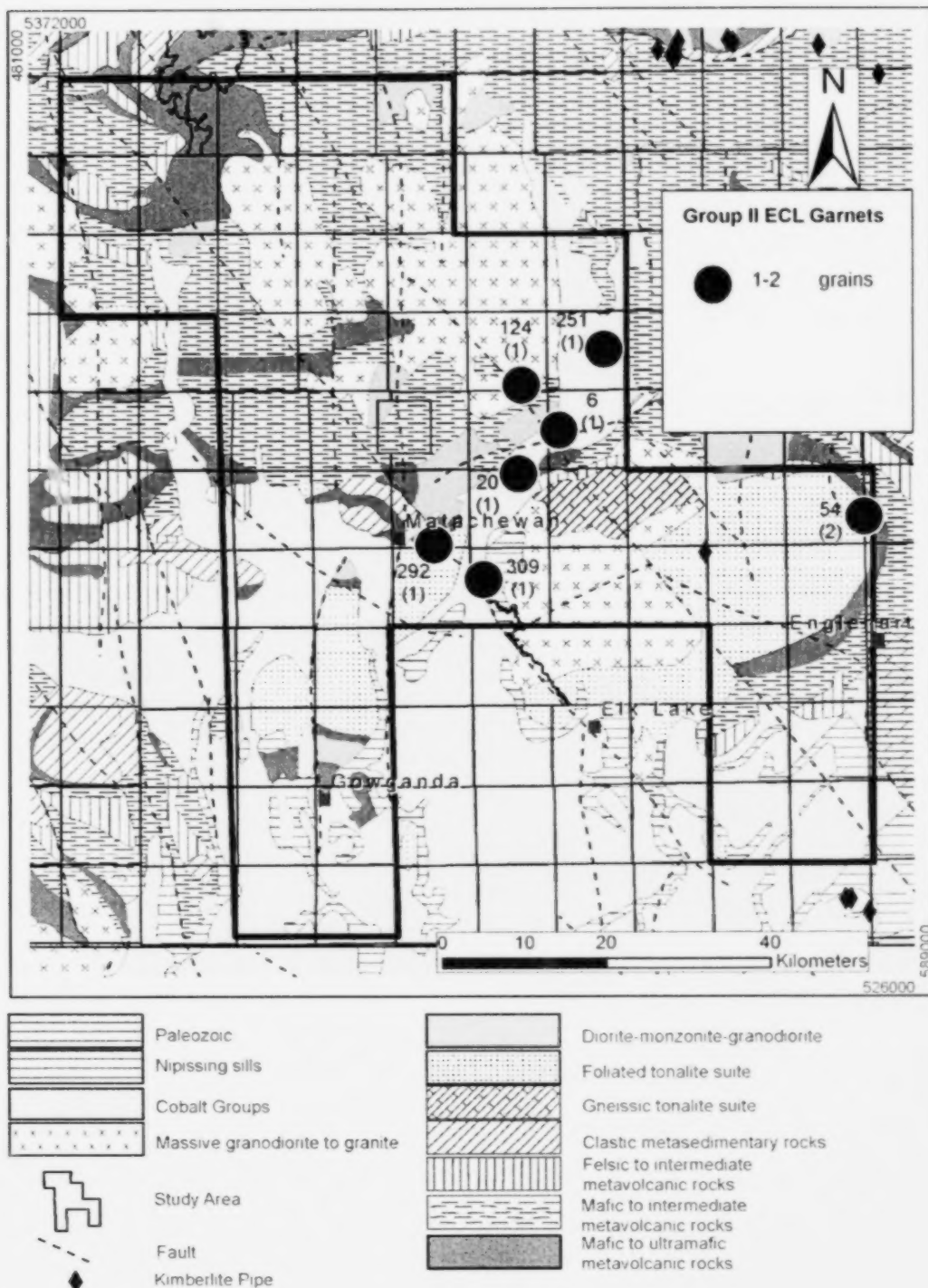


**Figure 15.** Regional distribution of Group II eclogitic garnet grains. Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.



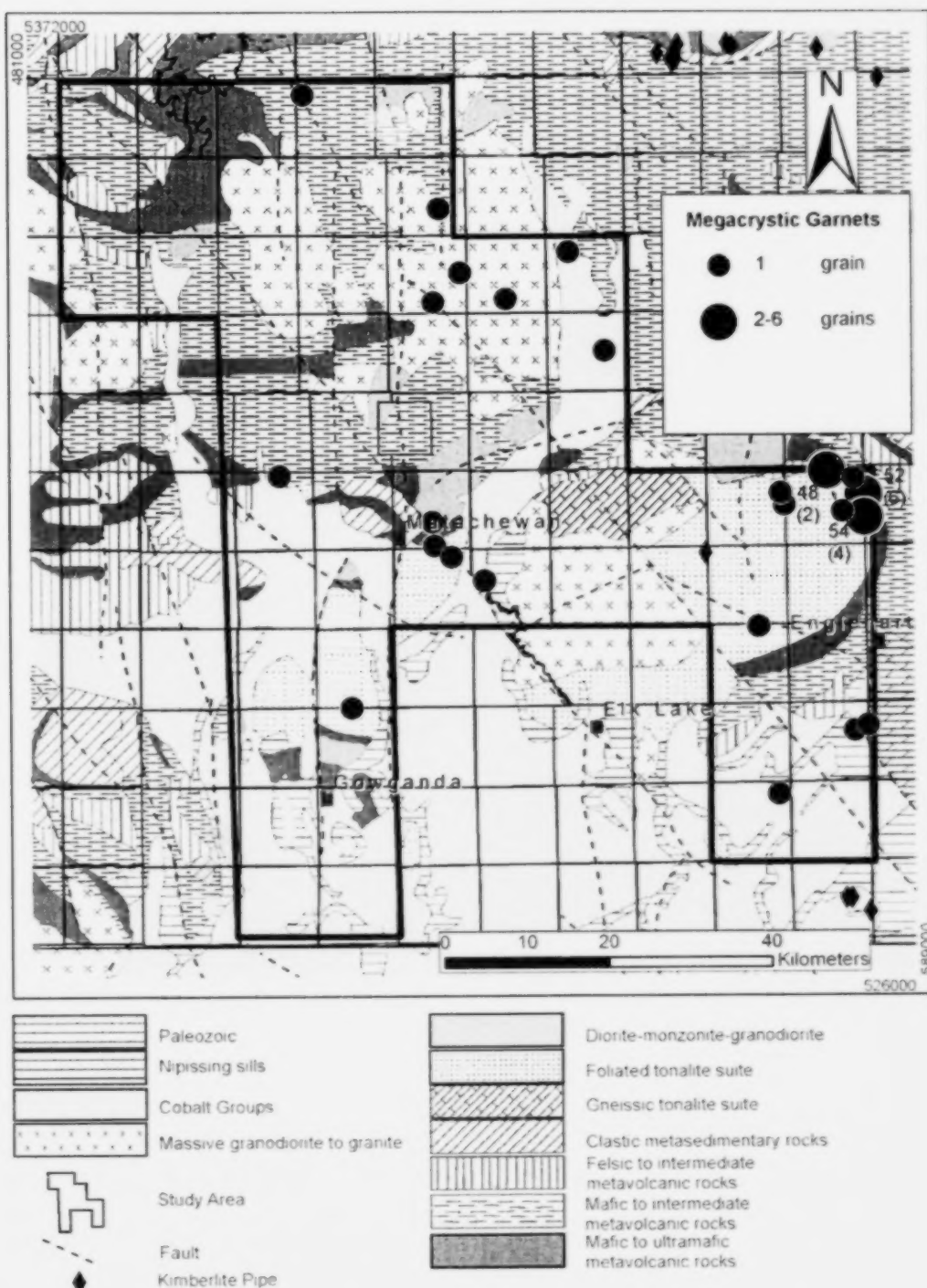


**Figure 16.** Regional distribution of chromium-poor megacrystic garnet grains. Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.

## Chromites

Chromite represents one compositional end-member in the spinel group of minerals and occurs widely in mafic to ultramafic rocks. Kimberlitic chromite grains allow the determination of the amount of chromite harzburgite sampled and disaggregated by the kimberlite (Fipke, Gurney and Moore 1995). Evidence summarized by Griffin et al. (1994) suggests that  $\text{Cr}_2\text{O}_3$  increases with temperature and pressure in chromite. Thus, chromite with high  $\text{Cr}_2\text{O}_3$  is most likely to have originated at depth and can be interpreted to be of kimberlitic origin. Therefore, Cr is a significant indicator of diamond potential.

Chromites have distinct compositional characteristics that can be used in exploration programs to determine diamond potential of an area. Chromites plotting in the diamond inclusion field generally contain concentrations of  $\text{MgO} > 10 \text{ wt } \%$  and  $\text{Cr}_2\text{O}_3 > 61 \text{ wt } \%$  (Figure 17). Finding such a chromite in surficial material or a rock sample is just as significant as finding a G10 Cr-pyrope garnet (Stephenson, Morris and Crabtree 1999).

Fipke, Gurney and Moore (1995) proposed that the  $\text{TiO}_2$  and  $\text{Cr}_2\text{O}_3$  concentrations of chromites can be used to isolate kimberlitic and lamproitic chromites from other sources. In general, the largest population of chromites recovered during modern alluvium surveys is characterised by Ti-poor compositions (likely from a combination of crustal and mantle sources); these plot in the field of compositional overlap with other sources (Ontario Geological Survey 2001). However, chromites that plot in this overlap field may be considered as possible kimberlite indicator minerals.

A total of 6160 chromite grains were recovered by heavy mineral processing and sent for microprobe analysis. Geochemical classification resulted in the following distinctions: 5 diamond inclusion / intergrowth chromites; 167 considered to be unique to the kimberlites and lamproites; 5395 of possible kimberlitic affinity (overlap field); 180 non-kimberlitic/lamproitic; and 413 not to be chromite. Figure 17 shows the distribution of the compositional data on a  $\text{MgO}$  vs.  $\text{Cr}_2\text{O}_3$  plot. Figure 18 illustrates the distribution of the data on the Fipke, Gurney and Moore (1995)  $\text{TiO}_2$  vs.  $\text{Cr}_2\text{O}_3$  binary plot. One grain from each of samples MA-024, MA-075, MA-167 and SG-10 plot in the diamond inclusion field. One grain from sample MA-167 falls in the diamond intergrowth field. Electron microprobe analyses results for chromite grains is listed in Appendix E (also see MRD 129).

If the picked versus estimated grain counts for individual samples are taken into account, the estimated total number of recovered chromite grains increases from 6160 to 31 592, therefore the number of possible KIMs increases to 31 240 grains (31 592 recovered grains minus 5 diamond intergrowth/inclusion chromites, 167 unique to the kimberlites and lamproites and 180 non-kimberlitic chromite grains). The regional distribution of diamond inclusion chromites, total KIM chromite and total KIM chromites including those of possible kimberlitic affinity (overlap field) based on picked and estimated data are shown in Figures 19, 20 and 21, respectively. Information on samples in which the number of grains was estimated is summarized in Appendix K.

Three of the 5 diamond inclusion and intergrowth field (DIIF) grains were recovered from samples west of the Montreal River Fault and 2 to the east (Figure 19). One of the grains was recovered from sample MA-075, just upstream from sample MA-240, in Beauchamp Township. The other grain was found in sample MA-024, near the Montreal River Fault, in Cairo Township. Sample SG-10, in Bannockburn Township, contained 1 DIIF chromite grain. Sample MA-167, located in Milner Township, contained 2 grains. This sample was collected on the southwest margin of the Round Lake Batholith.

Some of the chromite KIM and possible chromite KIM grains appear to be associated with the Englehart and Montreal River faults, part of the Lake Timiskaming Structural zone (Figures 20 and 21).

The sample with the most chromite KIM grains is MA-110, collected in the vicinity of ultramafic intrusions in Eldorado Township (Ayer et al. 2005). The other 4 anomalous samples (MA-022, 134, 138 and 149) were collected north to west of Matachewan. The sample with the most possible KIM chromite grains (MA-138) was collected in northwest Baden Township, near the intersection of the Mistinikon Lake Fault and the Montreal River Fault. The largest cluster of possible chromite KIMs is found along the Montreal River Fault in the vicinity of Matachewan. Chromite is the KIM species most resistant to weathering and thus could account for the large concentrations found in the study area. There does not appear to be an obvious explanation for the cluster of possible chromite KIM anomalies in the western portion of the study area.

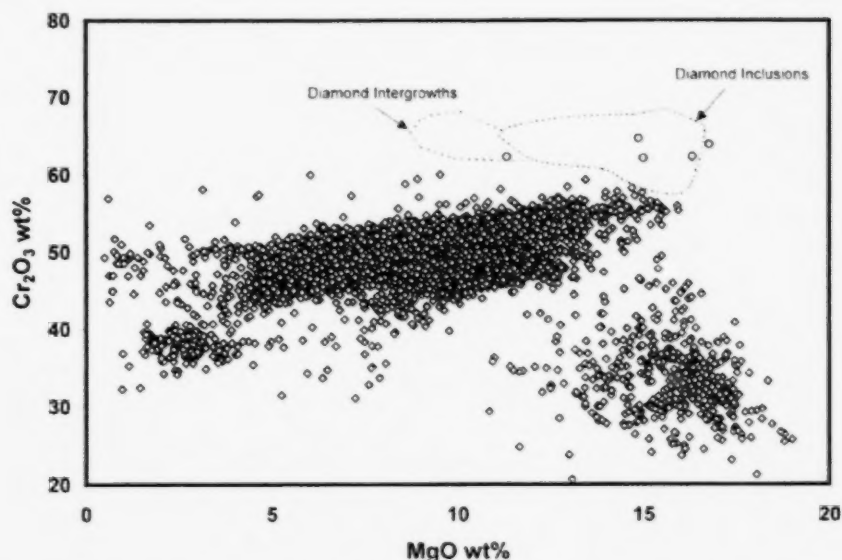


Figure 17. MgO-Cr<sub>2</sub>O<sub>3</sub> plot of all chromite grains recovered from the study area (after Fipke, Gurney and Moore 1995).

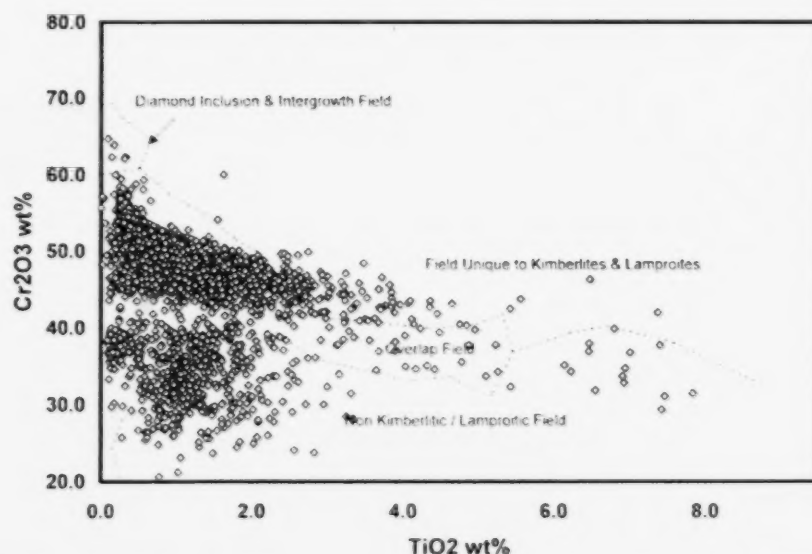


Figure 18. TiO<sub>2</sub>-Cr<sub>2</sub>O<sub>3</sub> plot of all chromite grains recovered from the study area (after Fipke, Gurney and Moore 1995).

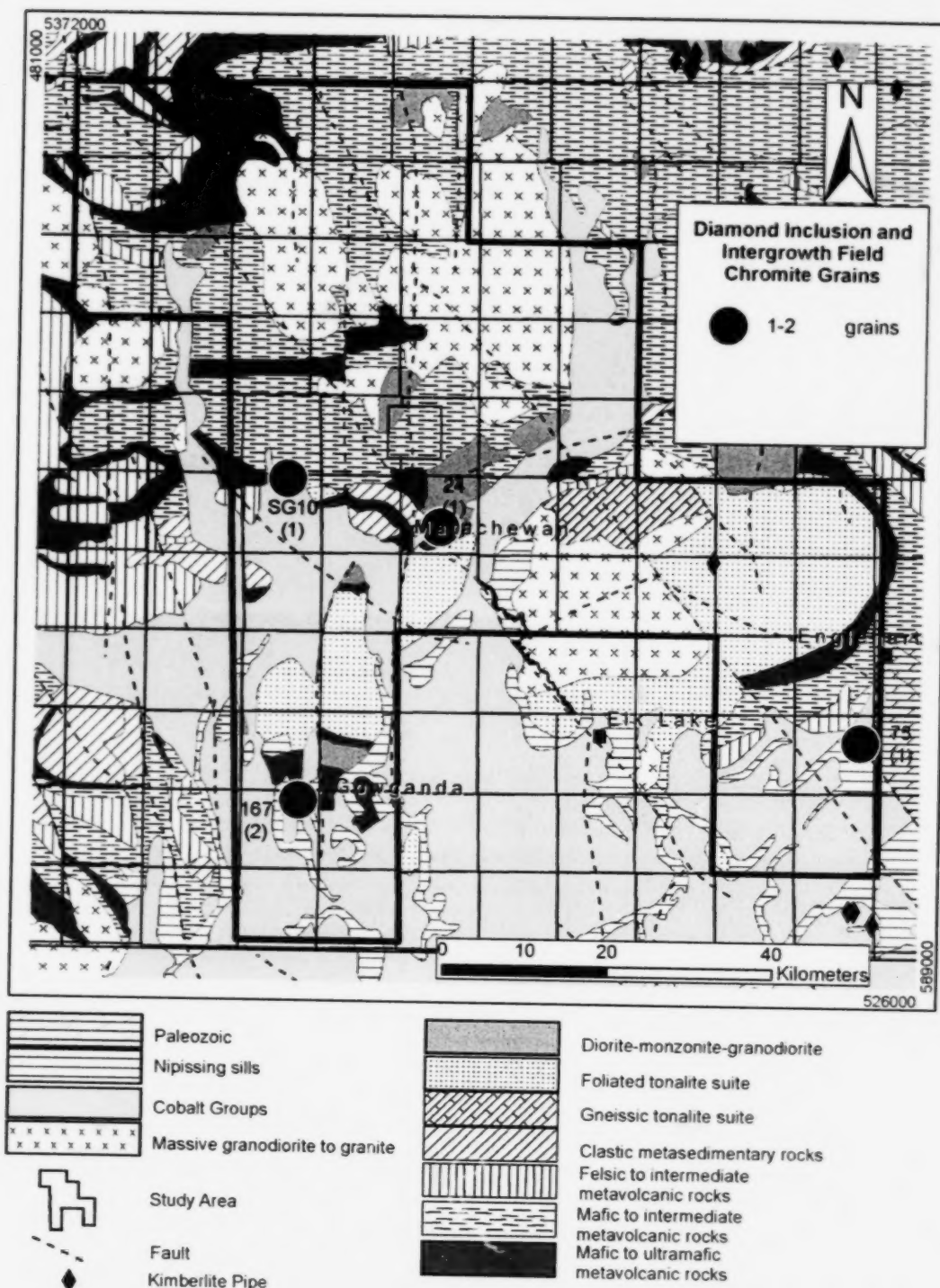


**Figure 19.** Regional distribution of diamond inclusion and intergrowth field chromite grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

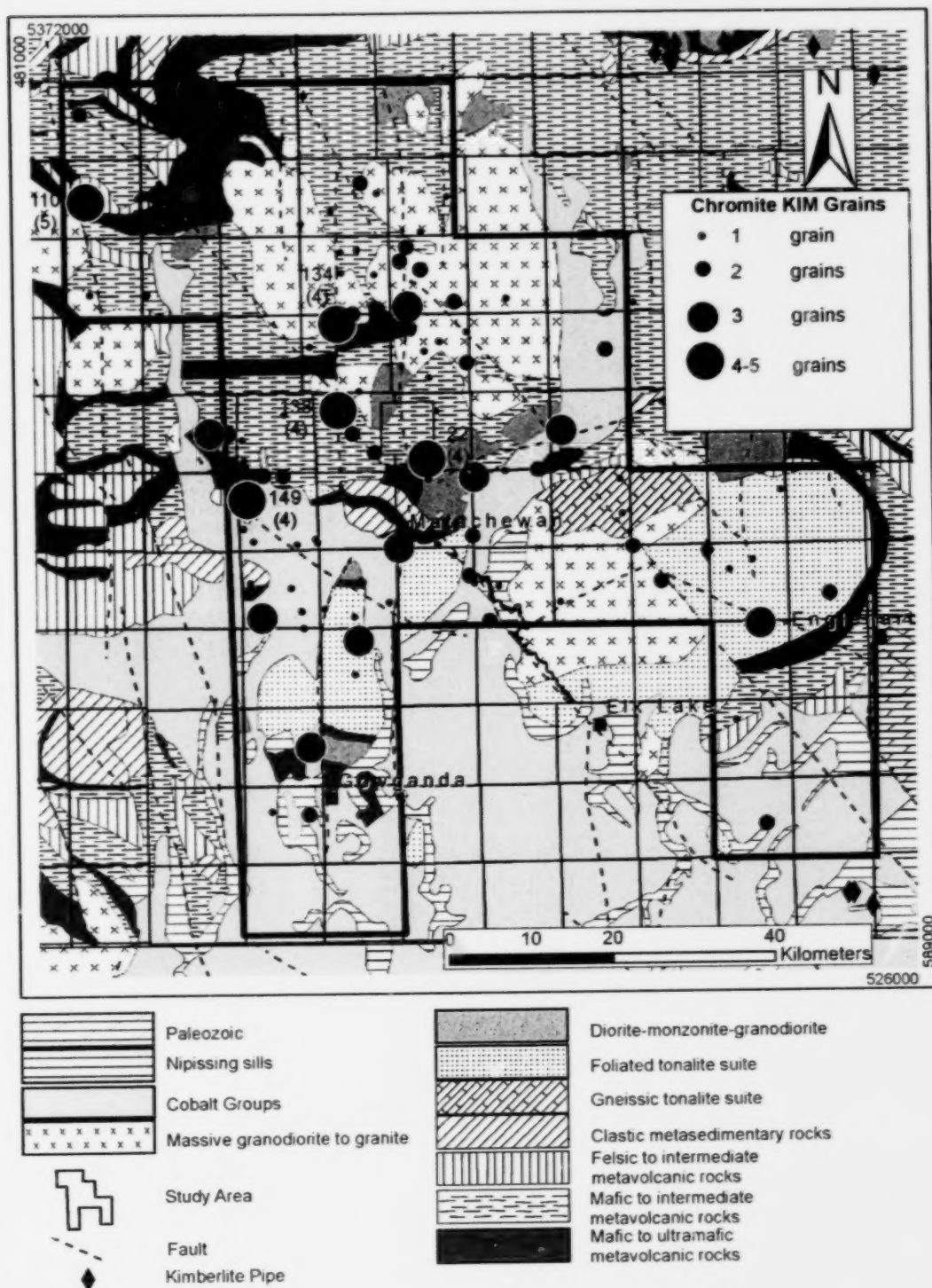


**Figure 20.** Regional distribution of chromite KIM grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.



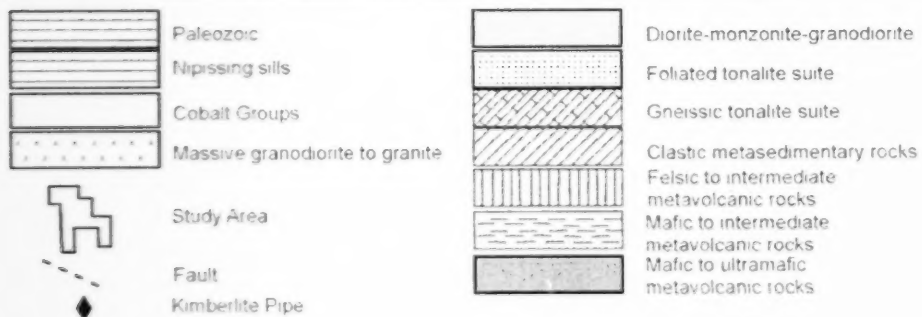
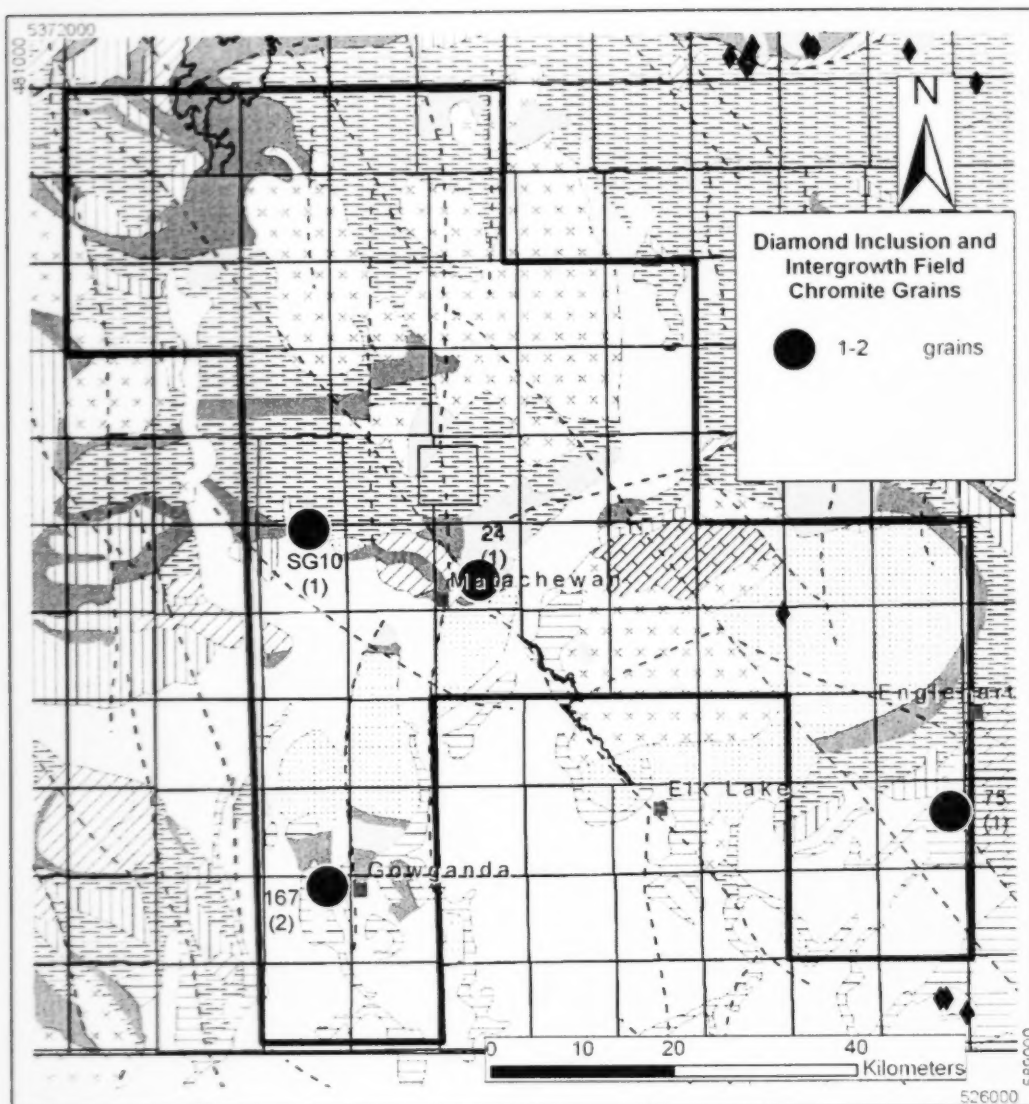


**Figure 19.** Regional distribution of diamond inclusion and intergrowth field chromite grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

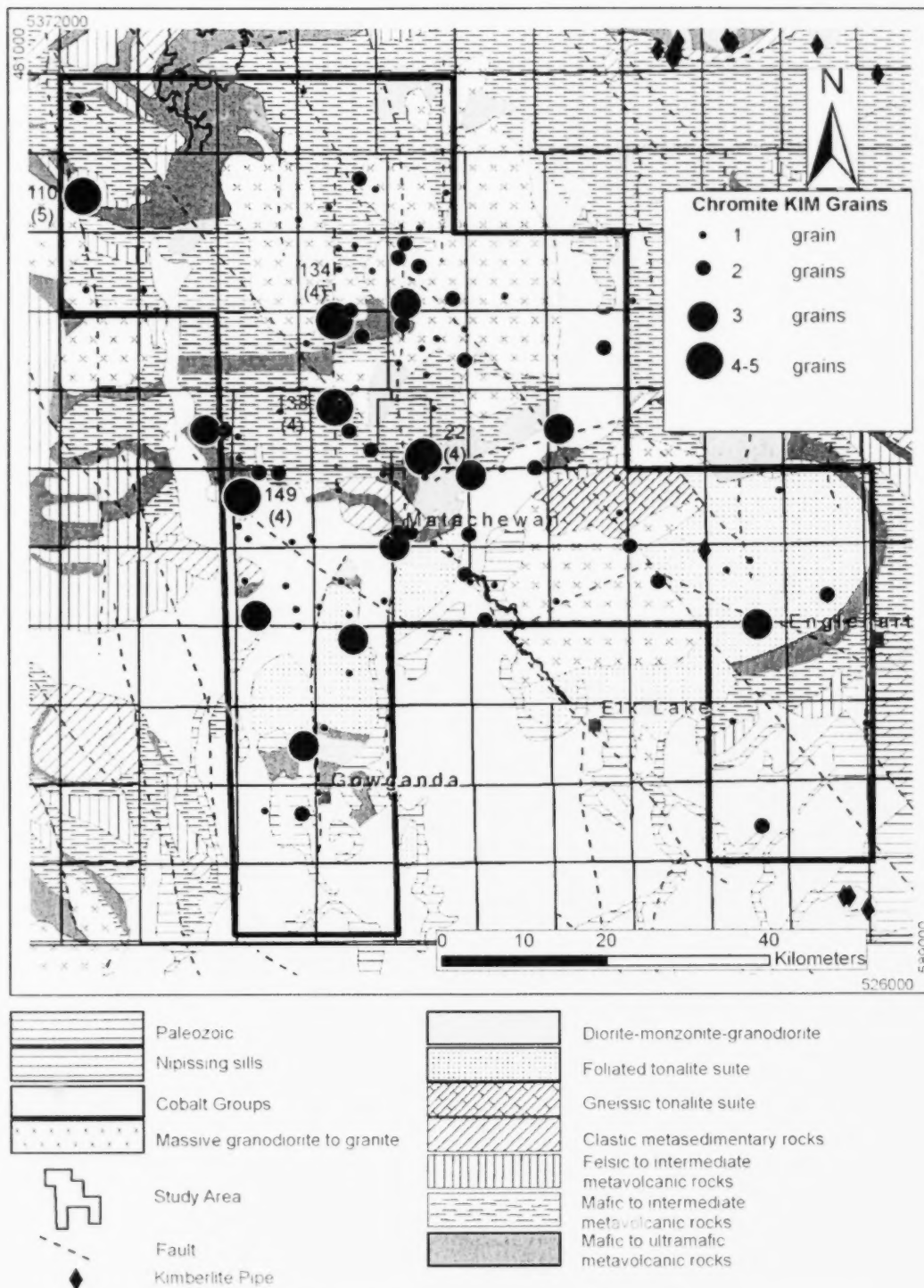


**Figure 20.** Regional distribution of chromite KIM grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.



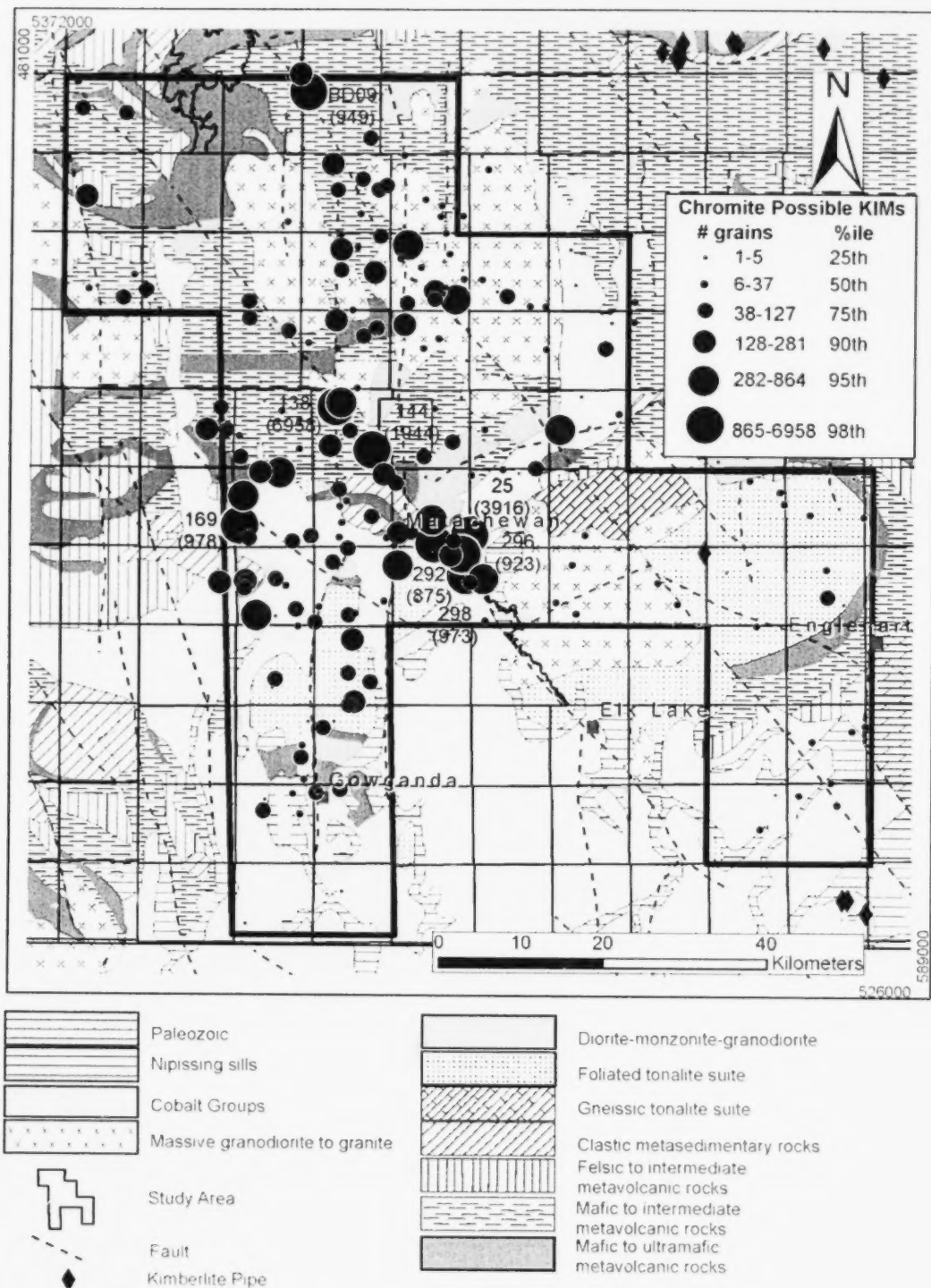


**Figure 21.** Regional distribution of possible chromite KIM grains (includes overlap field chromites). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

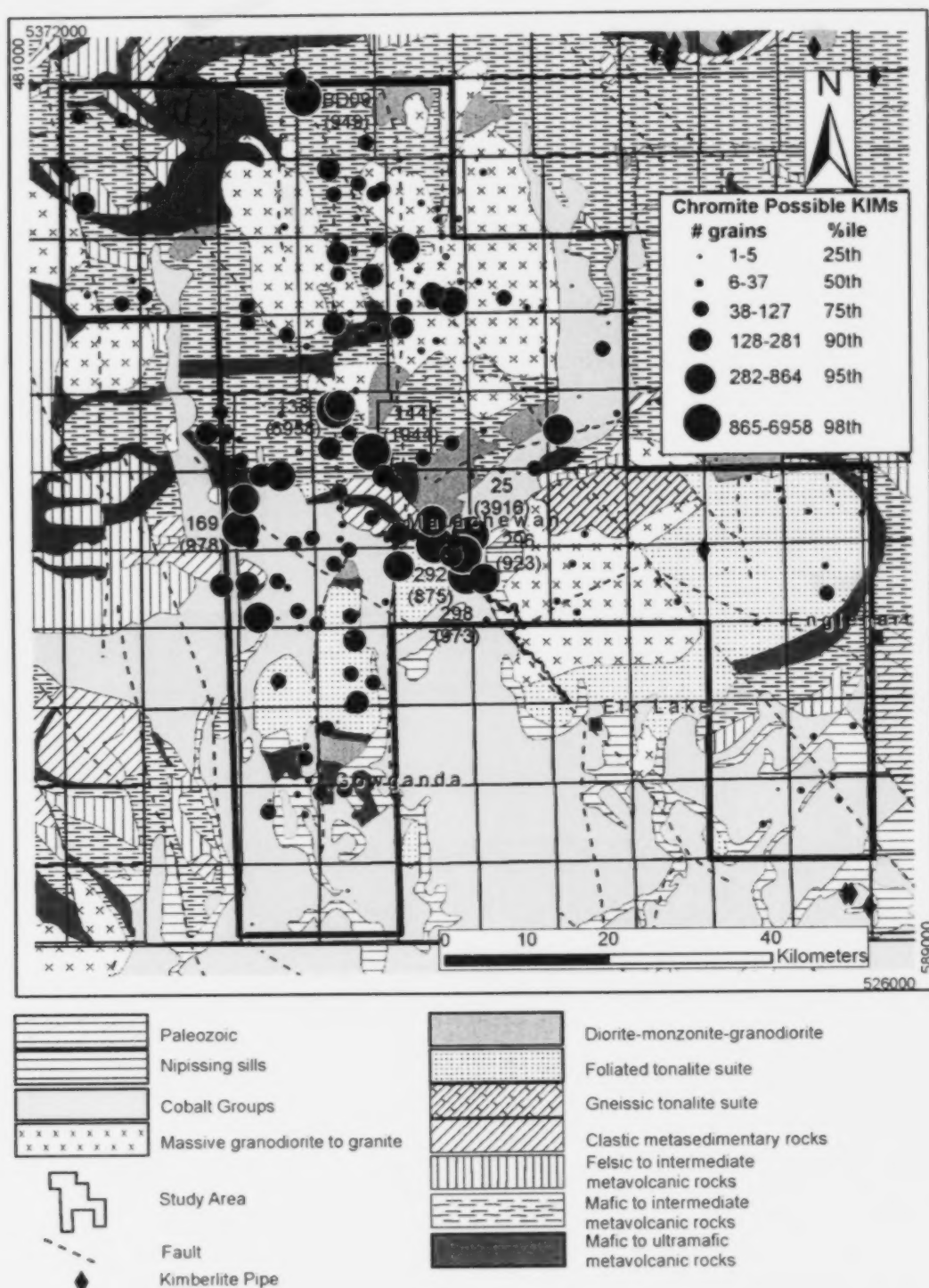


**Figure 21.** Regional distribution of possible chromite KIM grains (includes overlap field chromites). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

## Cr-Diopside

Cr-diopside is not a definitive kimberlite indicator since it occurs in both kimberlite and other basic and ultrabasic rocks. It is, however, one of the major mineral components of the lherzolite-peridotite assemblage and since lherzolites are not a major source of diamonds, Cr-diopside can only be considered useful as a KIM and not as a diamond indicator mineral (Ontario Geological Survey 2001). Cr-diopside associated with lherzolitic rock is commonly considered to have high Cr values ( $>1.5$  wt %) (McClenaghan et al. 1999b). More recently Morris, Sage and Ayer (1999) have developed a ternary plot classification of Cr-diopsides, which has proven to be an excellent way of discriminating between Cr-diopsides derived from kimberlite and other sources. A ternary plot of atomic Cr-Al-Na has been used to define Cr-diopside derived from a deep mantle source as opposed to a shallow crustal source. For kimberlitic Cr-diopsides, the Cr values range from 1 to 40 molar % and Al ranges from 2 to 50 molar %.  $\text{Na}_2\text{O}$  ranges are related to Cr content.

A total of 1442 Cr-diopside grains were identified by microprobe analysis. The ternary plot of Cr-Al-Na indicates that 69 grains could be classified as kimberlitic (Figure 22). Of these 69 kimberlitic Cr-diopsides, 18 were high Cr-diopsides ( $\text{Cr}_2\text{O}_3 > 1.5$  wt %). Of the remaining 1373 non-kimberlitic diopsides, 1218 contained between 0.5 and 1.5 wt %  $\text{Cr}_2\text{O}_3$ , 20 are high Cr-diopsides ( $\text{Cr}_2\text{O}_3 > 1.5$  wt %) and 135 are low Cr-diopsides ( $\text{Cr}_2\text{O}_3 < 0.5$  wt %).

The distribution of kimberlitic Cr-diopside grains in the survey area is illustrated in Figure 23. The Cr-diopside grains are scattered throughout the survey area with the majority of the grains east of the Englehart River Fault. A cluster of 4 anomalous samples (MA-048, 050, 052 and 054) are located in northeast Pacaud Township. Sample site MA-240, which contained one of the G10 garnets, hosts 3 Cr-diopside grains. A cluster of anomalous samples is located near the Englehart River Fault within the Watabeag Batholith.

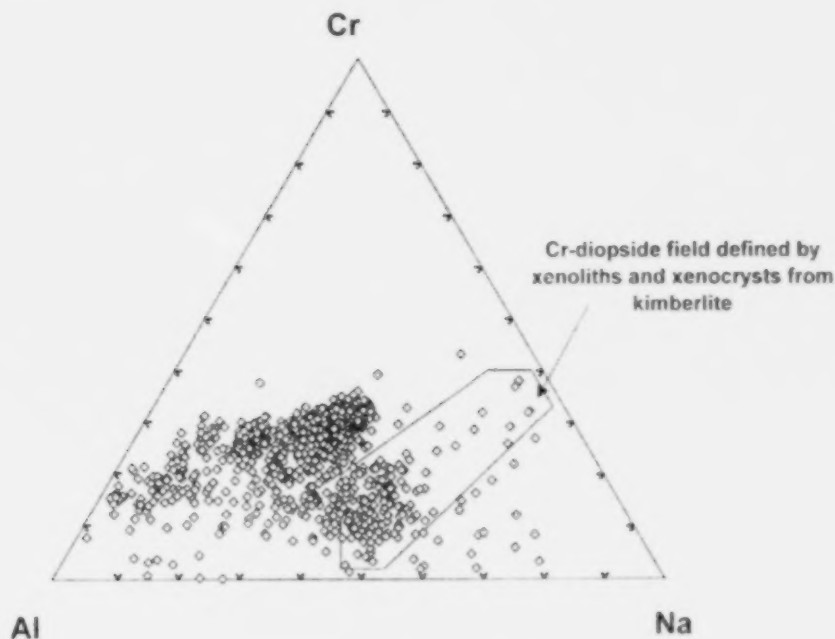


Figure 22. Ternary plot of atomic Cr-Al-Na showing all Cr-diopside grains from the survey area (after Morris, Sage and Ayer 1999).

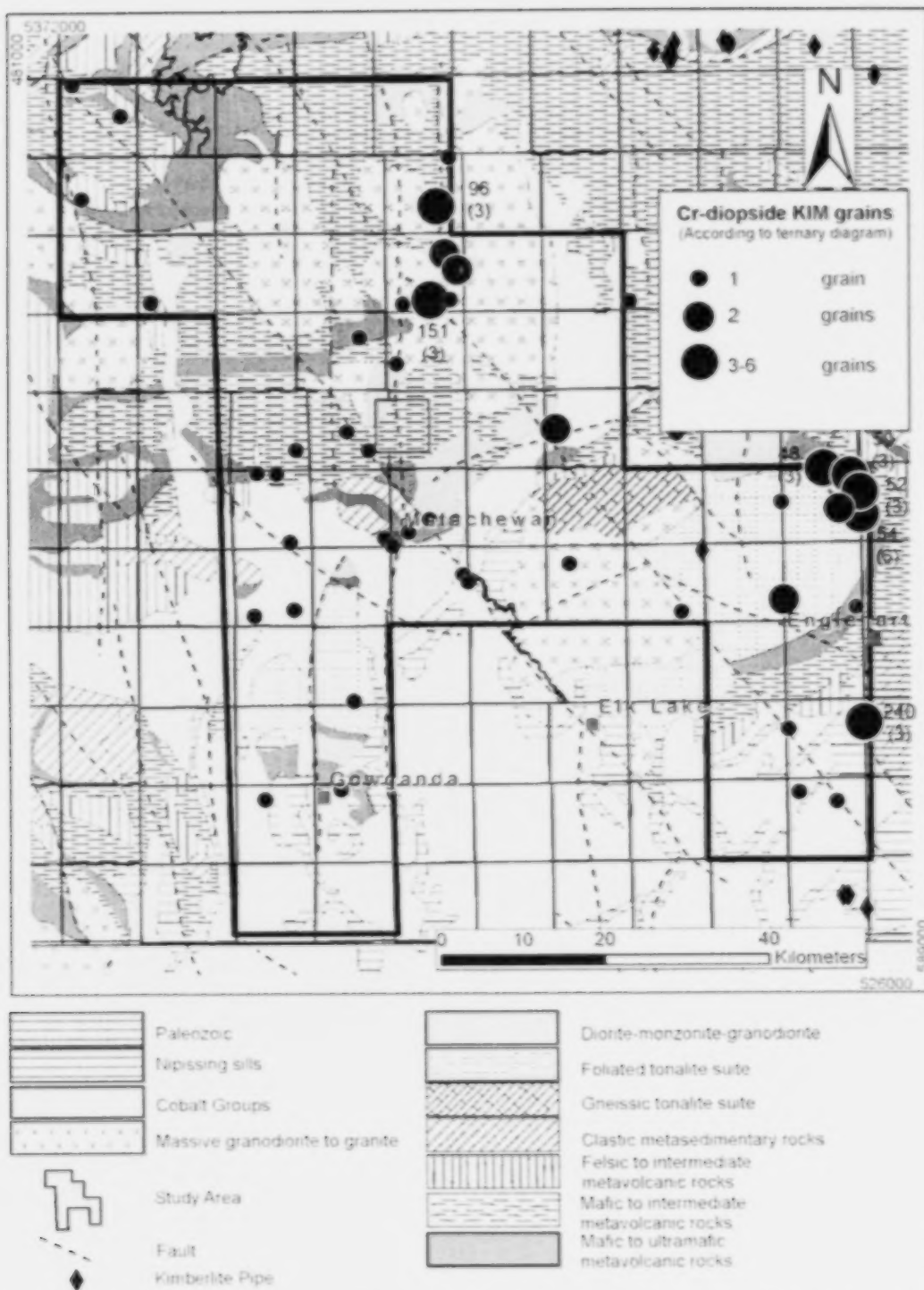


**Figure 23.** Regional distribution of Cr-diopside KIM grains that fall within the field shown in Figure 22. Anomalous sites are labelled by sample number with corresponding number of grains in brackets.

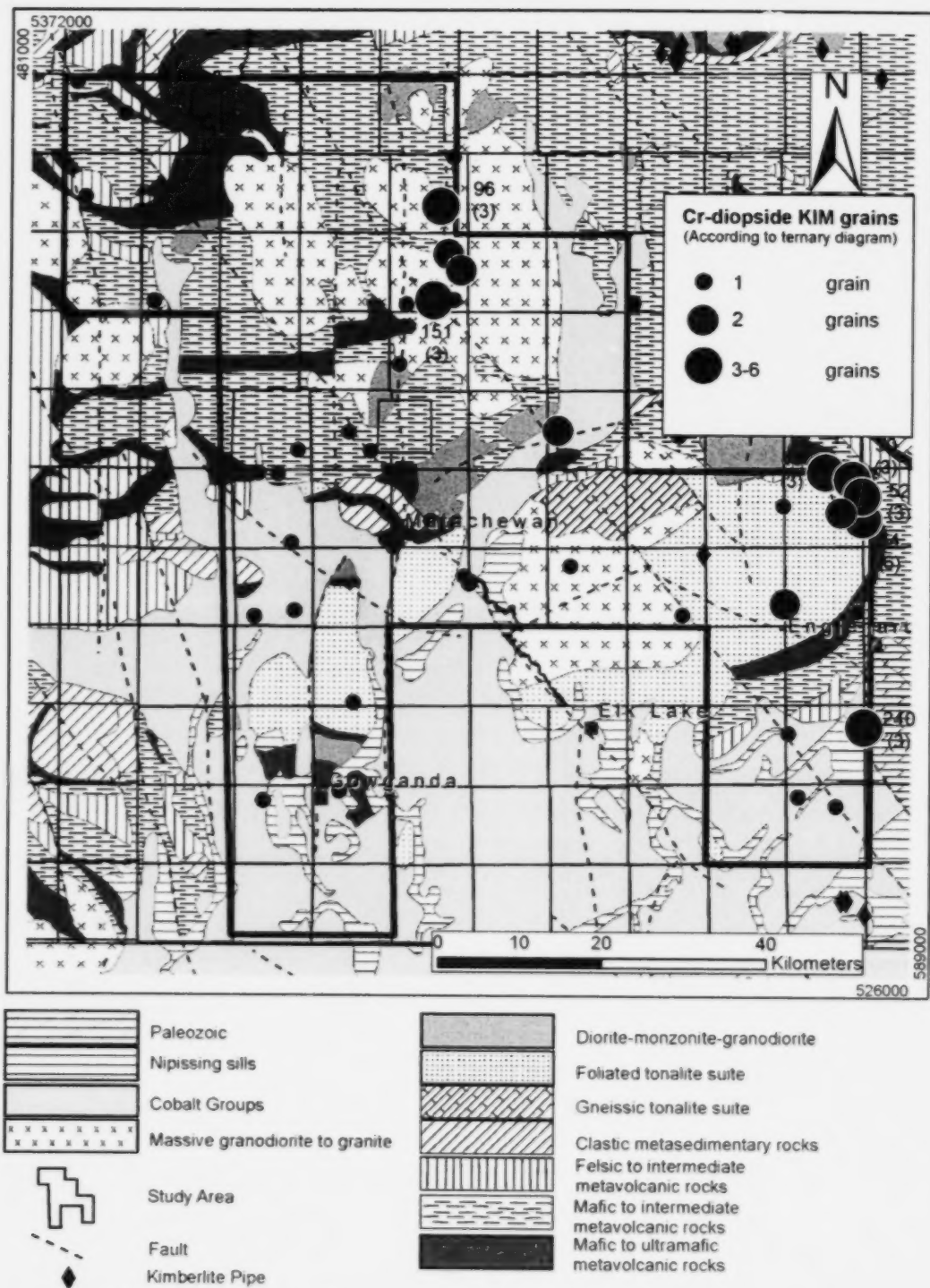


**Figure 23.** Regional distribution of Cr-diopside KIM grains that fall within the field shown in Figure 22. Anomalous sites are labelled by sample number with corresponding number of grains in brackets.



An additional classification of kimberlitic Cr-diopsides was also used to examine the data. Figure 24 shows data on a binary plot of atomic  $\text{Ca}/(\text{Ca}+\text{Mg})$  versus  $\text{Na}_2\text{O}$  wt %. Further constraints on mantle-derived Cr-diopside compositions can be placed by projecting data on this plot. The choice of  $\text{Na}_2\text{O}$  as a variable on this diagram is important since there is a correlation between pressure and the amount of Na that can enter the Cr-diopside structure in the form of the jadeite molecule ( $\text{NaAlSi}_2\text{O}_6$ ) (Ontario Geological Survey 2001). This binary plot is based on Cr-diopside from both peridotite xenoliths carried in kimberlites (globally occurring) and xenocrysts from the Attawapiskat kimberlite field.

When 69 analyses that plot in the compositional field for mantle-derived Cr-diopside on the Al-Na-Cr ternary plot (Figure 22) are recast onto the  $\text{Ca}/(\text{Ca}+\text{Mg})$  vs.  $\text{Na}_2\text{O}$  wt % binary plot (Figure 24), only 23 of the grains have compositional characteristics similar to Cr-diopsides found in subcratonic mantle xenoliths. Therefore it is suggested that the use of 2 discriminating techniques is warranted for the Cr-diopsides found in the survey area. When the 23 Cr-diopsides identified here as having mantle-type geochemical signatures are plotted (Figure 25), the majority of the anomalous sites (samples MA-048, 052, 054, 056) plot in northeast Pacaud Township. Sample MA-066 is located in the Round Lake Batholith on the boundary of Savard and Chamberlain townships. The other anomalous sample (MA-240) was obtained in Beauchamp Township.

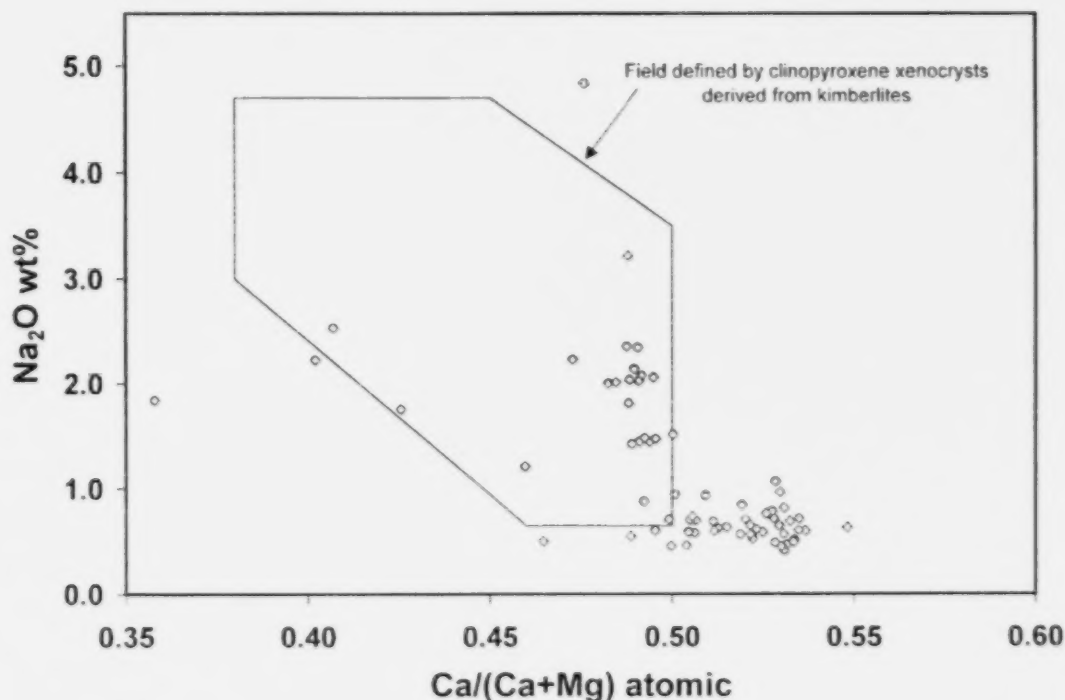


**Figure 24.**  $\text{Ca}/(\text{Ca}+\text{Mg})$  versus  $\text{Na}_2\text{O}$  classification scheme for clinopyroxene from the study area that plot within the field defined by mantle xenoliths and xenocrysts on the Al-Na-Cr ternary diagram (see Figure 22).



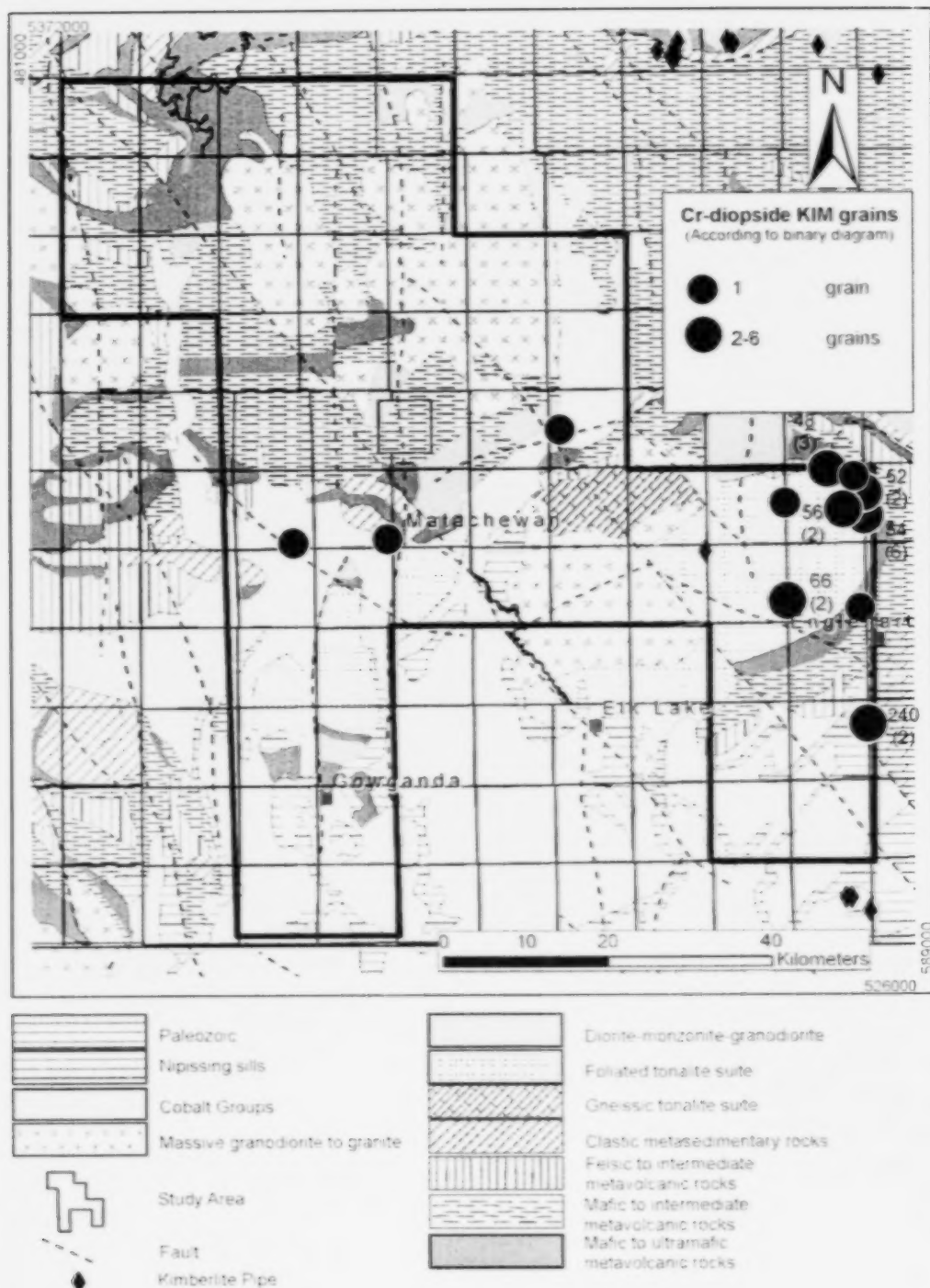


**Figure 25.** Regional distribution of Cr-diopside KIM grains shown on the Ca (Ca-Mg)-Na-O plot (see Figure 24). Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.

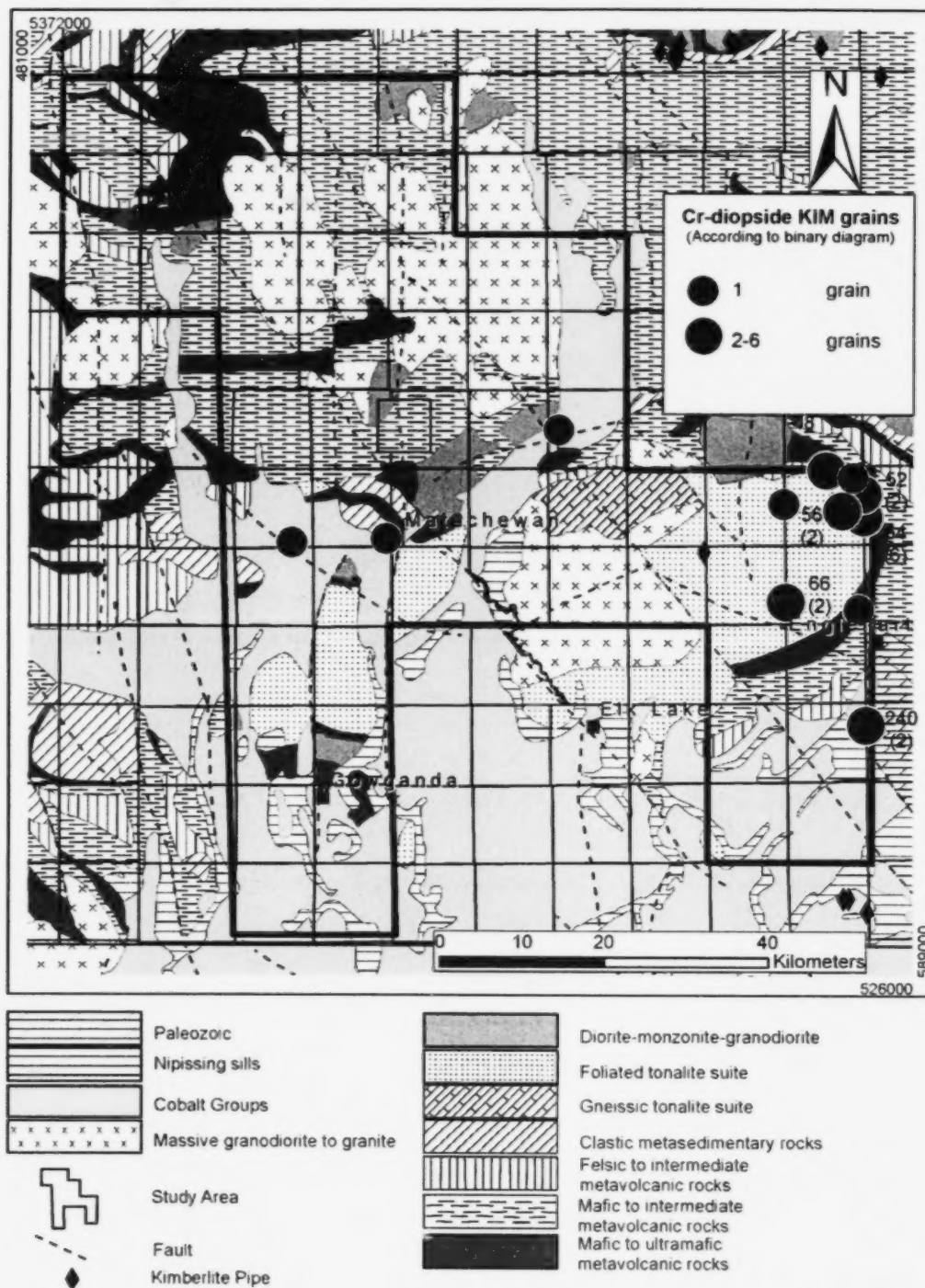


**Figure 25.** Regional distribution of Cr-diopside KIM grains shown on the  $\text{Ca}/(\text{Ca}+\text{Mg})\text{-Na}_2\text{O}$  plot (see Figure 24). Anomalous sites are labelled by sample number with corresponding number of grains shown in brackets.

## Ilmenite

Ilmenite is a common mineral in Ontario kimberlites (Sage 1996). Kimberlitic ilmenite is typically Mg-rich (4 to 16 wt %) and Cr-rich (0.1 to 11 wt %) (Mitchell 1986) and can be readily distinguished from Mg- and Cr-depleted ilmenite that is representative of crustal rocks. Ilmenite compositions are plotted on a MgO vs.  $\text{Cr}_2\text{O}_3$  parabolic plot in order to screen out compositions that are from crustal sources ( $\text{MgO} < 4$  wt %).

As the incorporation of the  $\text{Fe}_2\text{O}_3$  molecule into the ilmenite structure is dependent on the oxygen fugacity ( $f\text{O}_2$ ) in the kimberlitic magma (Hagerty and Tompkins 1983), ilmenite compositions may be used to predict whether magmatic conditions would have been favourable (reducing) or detrimental (oxidizing) for diamond preservation during kimberlite emplacement (Ontario Geological Survey 2001). Highly oxidizing conditions are known to promote diamond resorption and can remove up to 50% of the original diamond content (Gurney and Zweistra 1995). Ilmenites are abundant as macrocrysts in both kimberlite and its groundmass. Therefore, ilmenites are considered to be representative of both the depth and redox conditions of the magma chamber sampled and of subsequent changes that may have affected the kimberlite upon ascent and emplacement (Gurney and Zweistra 1995).

On a  $\text{MgO}/\text{Cr}_2\text{O}_3$  parabolic plot, ilmenites with  $\text{MgO} > 8$  wt % at increased concentrations of  $\text{Cr}_2\text{O}_3$  indicate high preservation potential (reduced environment). In contrast, ilmenites with  $\text{MgO} < 8$  wt % with little or no concentration of  $\text{Cr}_2\text{O}_3$  indicate less preservation potential (oxidized environment) (Fipke, Gurney and Moore 1995). The mantle source material had to be diamondiferous initially for the presence of diamond preservation ilmenites to be significant.

A total of 684 ilmenites were recovered from heavy mineral processing and sent for microprobe analysis. Of the 684 ilmenites, 23 were classified as KIMs and 661 were considered to be crustally derived. The KIM ilmenite population ranges in  $\text{MgO}$  content from 4.1 to 12.9 wt % (Figure 26). About half of the grain population is greater than 8 wt %  $\text{MgO}$  with variable  $\text{Cr}_2\text{O}_3$  content. The regional distribution of the ilmenite KIM grains is shown in Figure 27. The ilmenite anomalies are located primarily on the eastern side of the study area namely: northeastern Picaud Township; eastern Beauchamp Township; and northwestern Grenfell Township. Other areas with ilmenite KIM grains are located in the Matachewan area, one in the Watabeag Batholith and in northwestern Shaw Township.

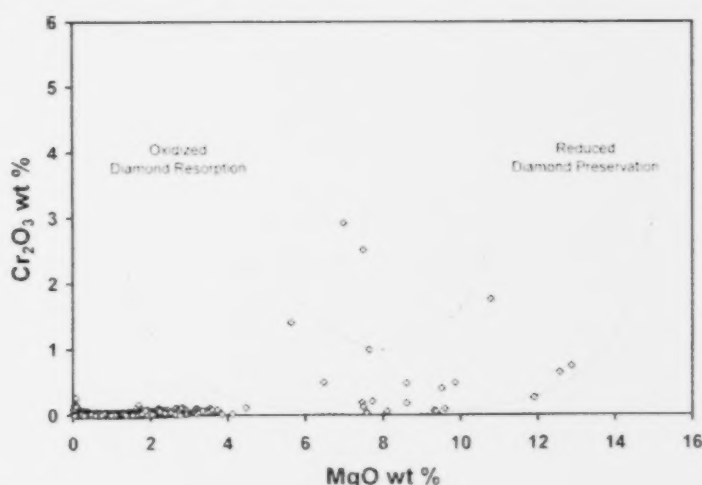


Figure 26.  $\text{MgO}-\text{Cr}_2\text{O}_3$  plot of kimberlite ilmenites ( $>4$  weight %  $\text{MgO}$ ) from the survey area (after Gurney and Moore 1993).

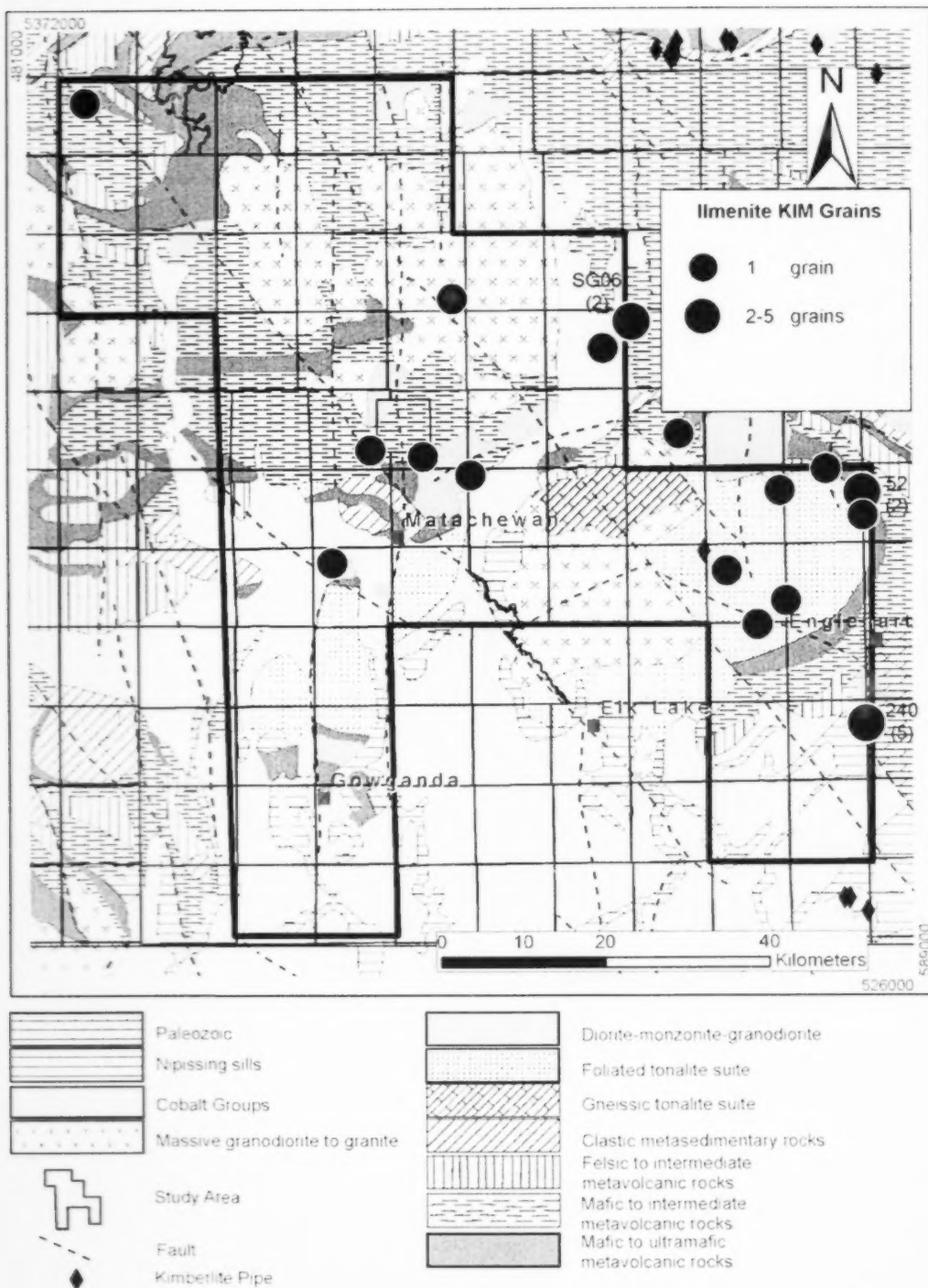


**Figure 27.** Regional distribution of ilmenite KIM grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

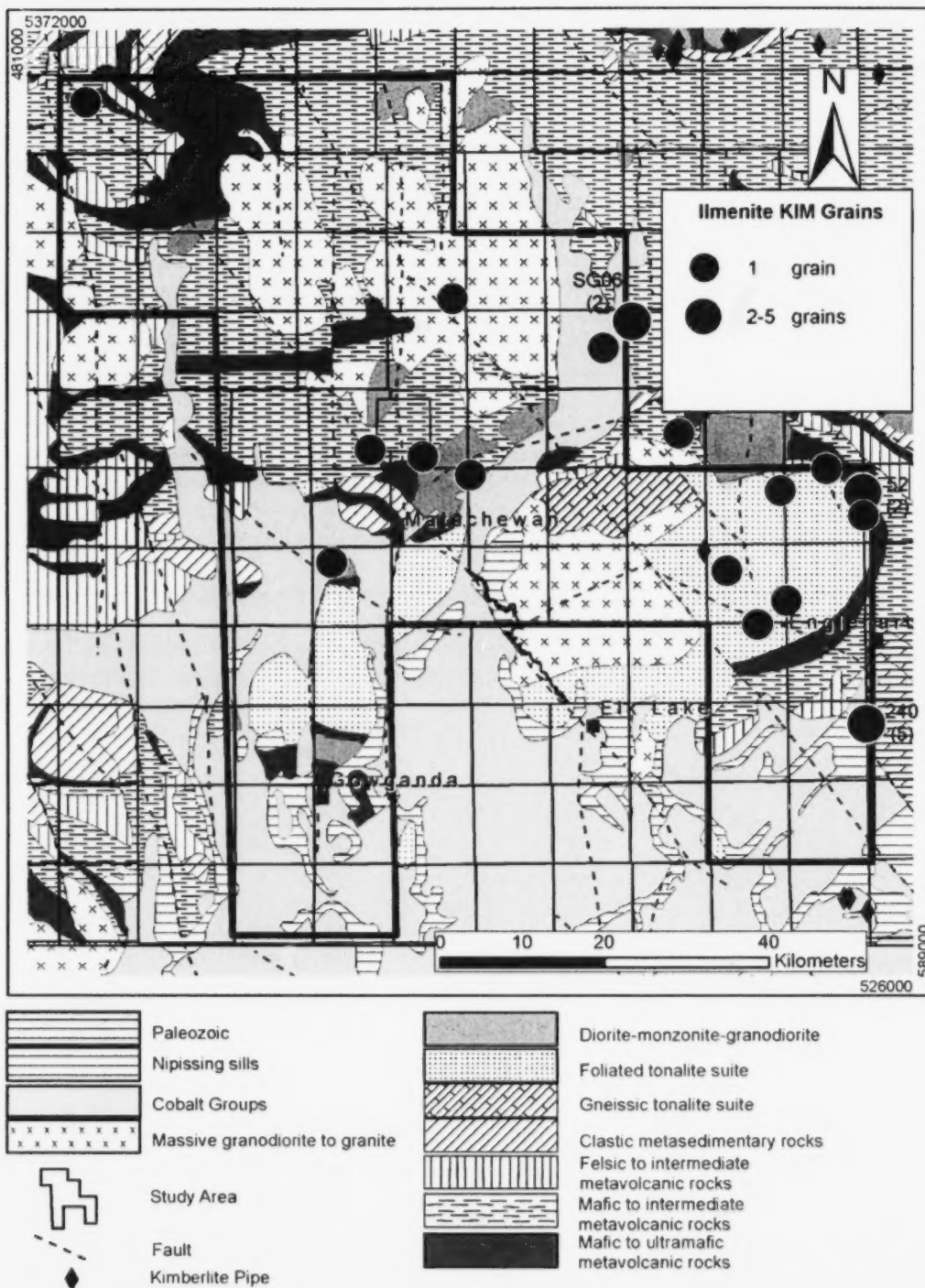


**Figure 27.** Regional distribution of ilmenite KIM grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.



## Olivine

Forsteritic olivine is a characteristic mineral in kimberlite but it is not unique to kimberlite as it can occur in a range of ultramafic supracrustal and plutonic rocks (Stone 2001). Olivines are easily weathered and break down quite readily during transport. As well, olivine is often completely altered in many kimberlites, such as the Kirkland Lake pipes (Sage 1996). This could be the reason for the lack of olivines recovered in this survey. According to Morris et al. (2000), forsteritic olivines with MgO number (MgO#) ( $\text{MgO}/(\text{MgO}+\text{FeO})$ ) greater than 90 are considered to be associated exclusively with kimberlite and those with MgO# between 80 and 90 are considered to be derived from mafic or kimberlitic sources.

A total of 23 olivine grains were recovered from heavy mineral processing and sent for microprobe analysis. Of the 23 grains, 21 have MgO numbers greater than 80 indicating that they are derived from mafic or kimberlitic sources (Figure 28). The regional distribution of the olivine KIM grains is shown in Figure 29. A cluster of samples containing kimberlitic olivines occurs to the southeast of the Lapointe kimberlite pipe in Savard Township. Other kimberlitic olivine grains were recovered from samples west of the Montreal River Fault. Six grains were obtained from a sample in northwestern Shaw Township and 2 grains from a sample in southwestern Fallow Township.

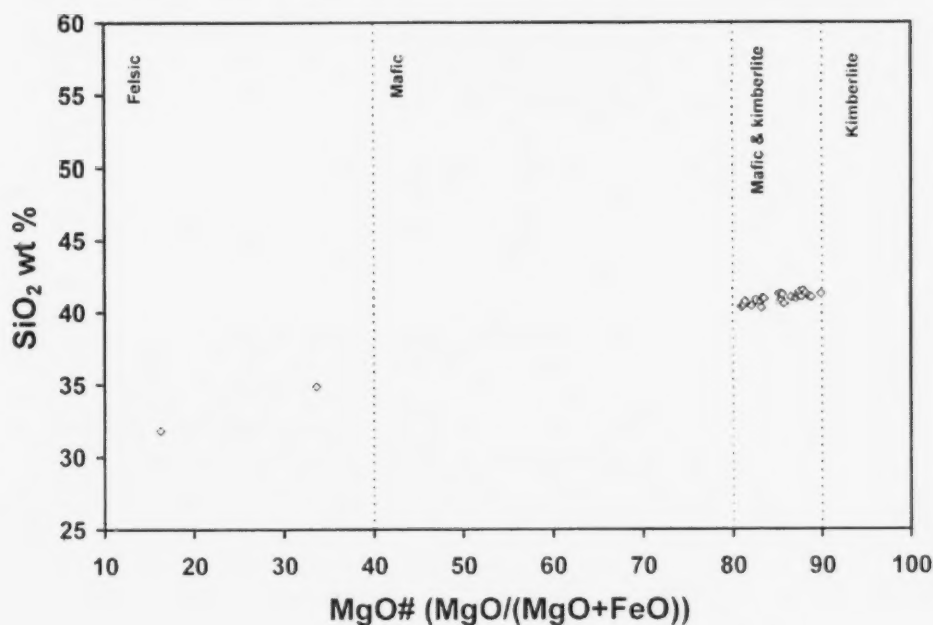


Figure 28. MgO number (MgO#) versus SiO<sub>2</sub> plot showing compositions of olivines recovered from the survey area.



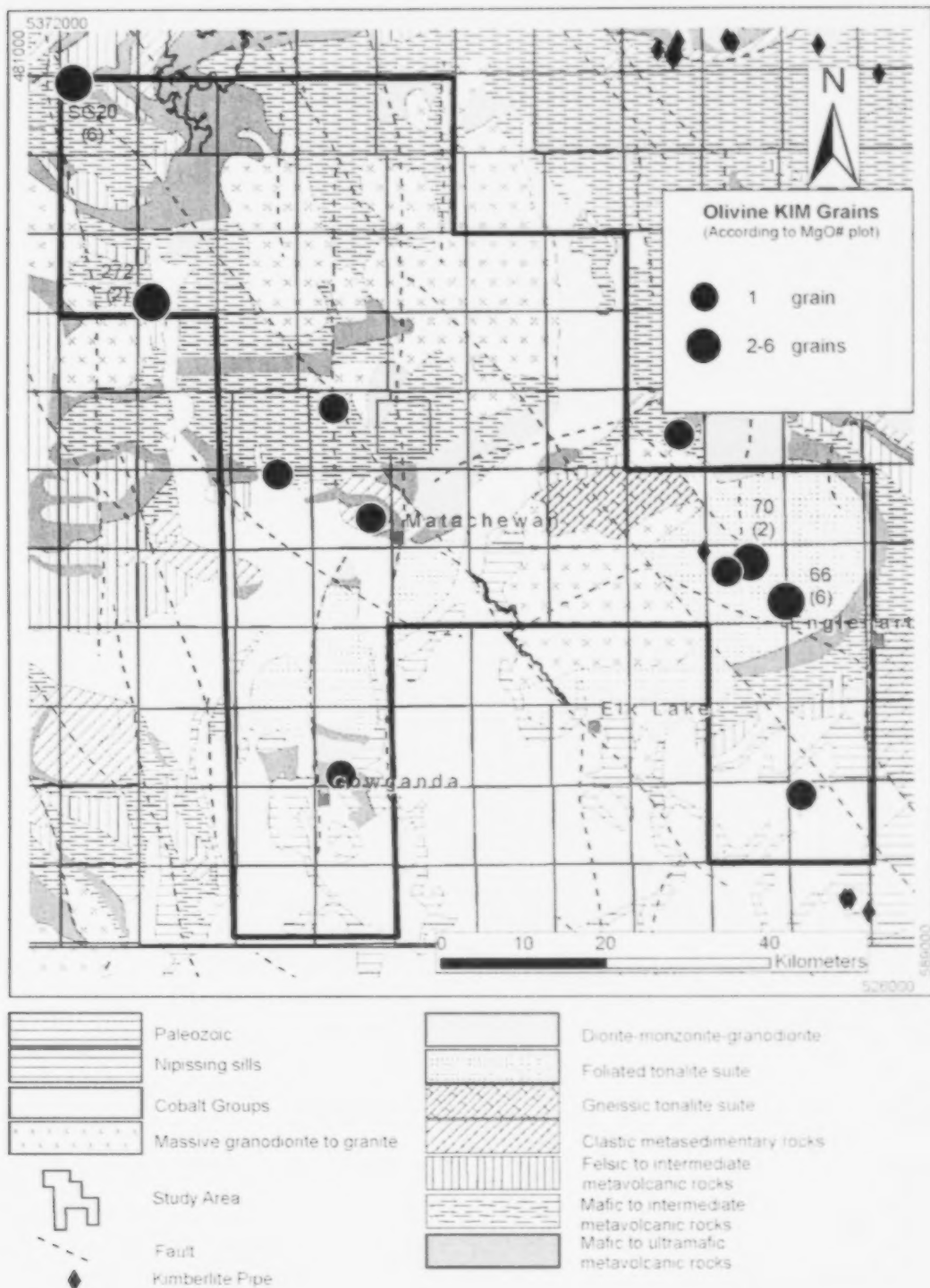


**Figure 29.** Regional distribution of olivine KIM grains according to MgO number (MgO#) versus SiO<sub>2</sub> plot (see Figure 28). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

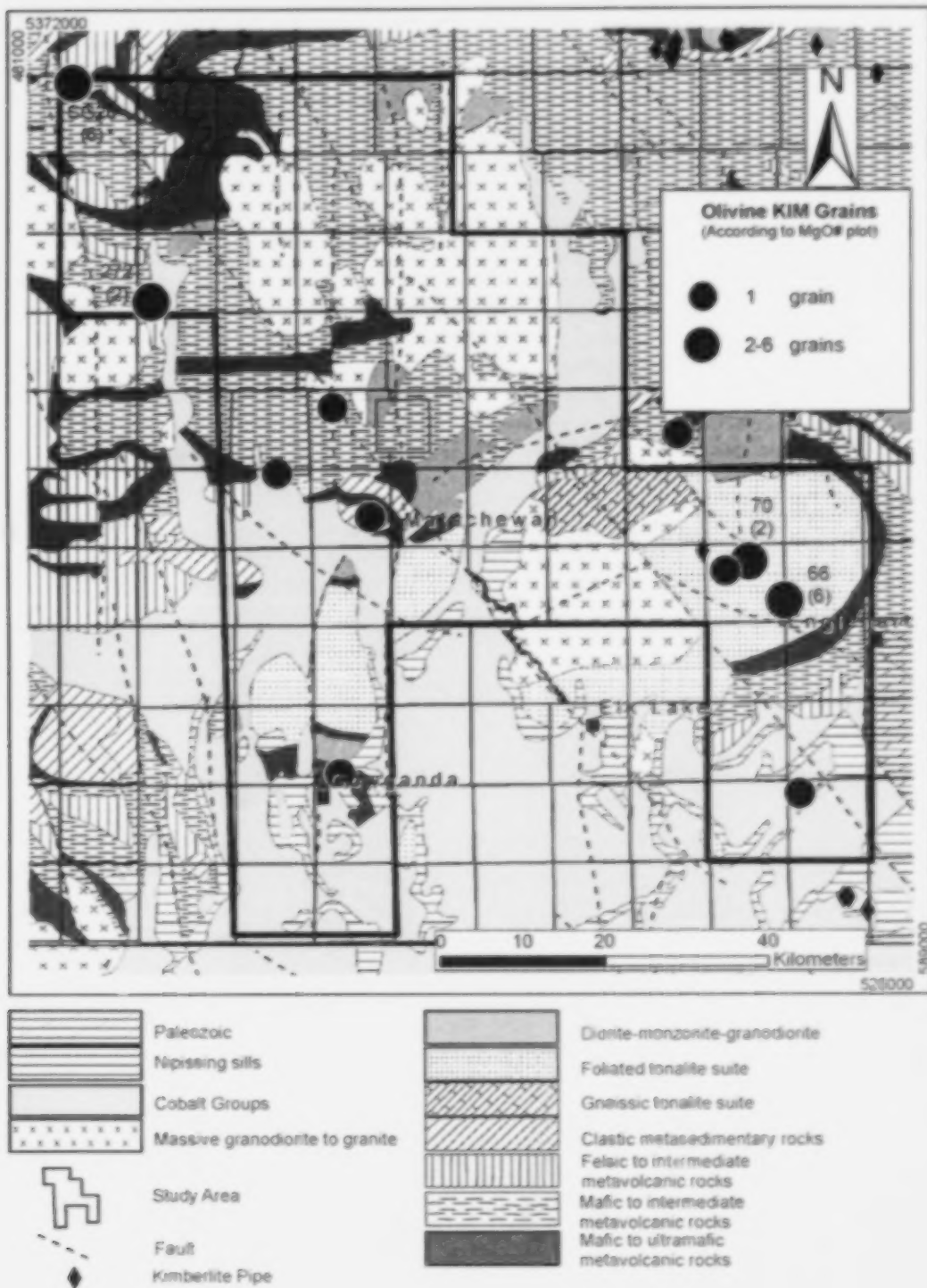


**Figure 29.** Regional distribution of olivine KIM grains according to MgO number (MgO#) versus SiO<sub>2</sub> plot (see Figure 28). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

Although the binary discriminant system used here (Morris et al. 2000) is capable of isolating olivine compositions from kimberlitic and other mafic rocks, compositional overlap is substantial (Ontario Geological Survey 2001). As a result, a classification technique was employed utilizing a large database of olivine compositions isolated from numerous kimberlitic heavy mineral concentrates from Ontario (Ontario Geological Survey 2001). Examination of minor element concentrations from 951 olivine grains picked from the Ontario kimberlite heavy mineral concentrates suggests that additional constraints may be placed on mantle-type olivine compositions crystallized at high pressures (Ontario Geological Survey 2001). The kimberlitic compositions are characterized by depleted CaO concentrations when the olivine data was plotted on a binary plot of forsterite content (Fo number) vs. CaO wt % (Ontario Geological Survey 2001). Fourteen of the 21 KIM olivine grains recovered in this survey plot within the field defined by olivine xenocrysts from Ontario kimberlites (Figure 30). These 14 grains show depleted CaO concentrations and increased Fo numbers. The samples are located in either the east or west side of the survey area (Figure 31). A cluster of 3 samples (MA-066, 070 and 076) are located in Savard Township.

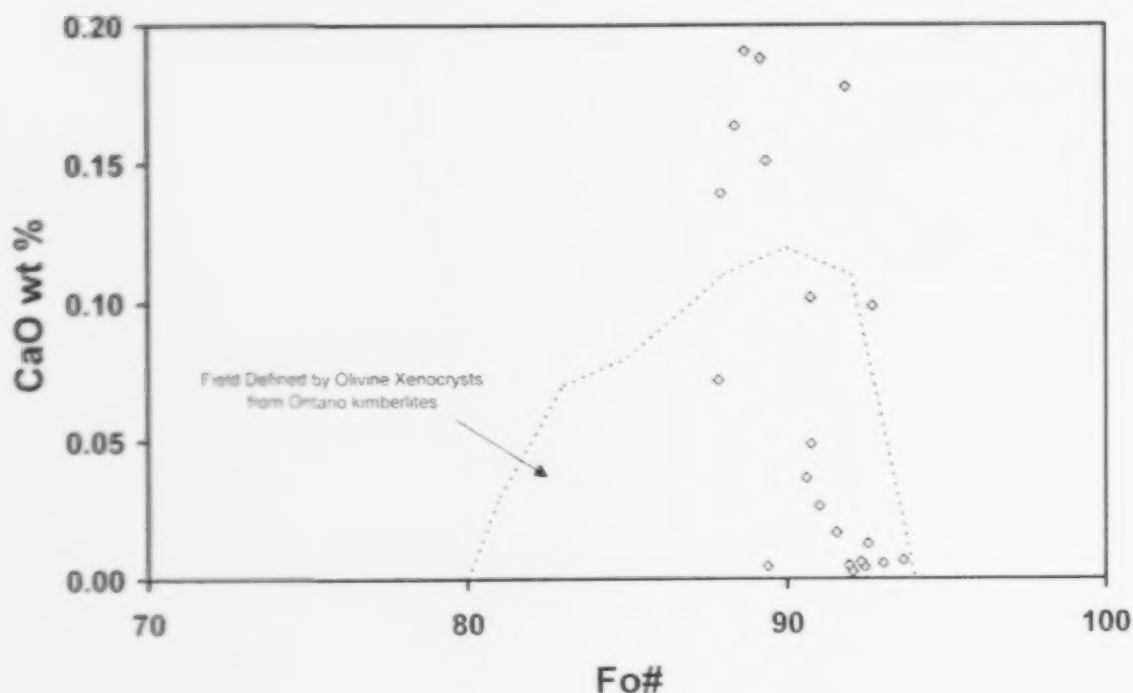


Figure 30. Forsterite content (Fo#) versus CaO plot for olivines recovered from the survey area.

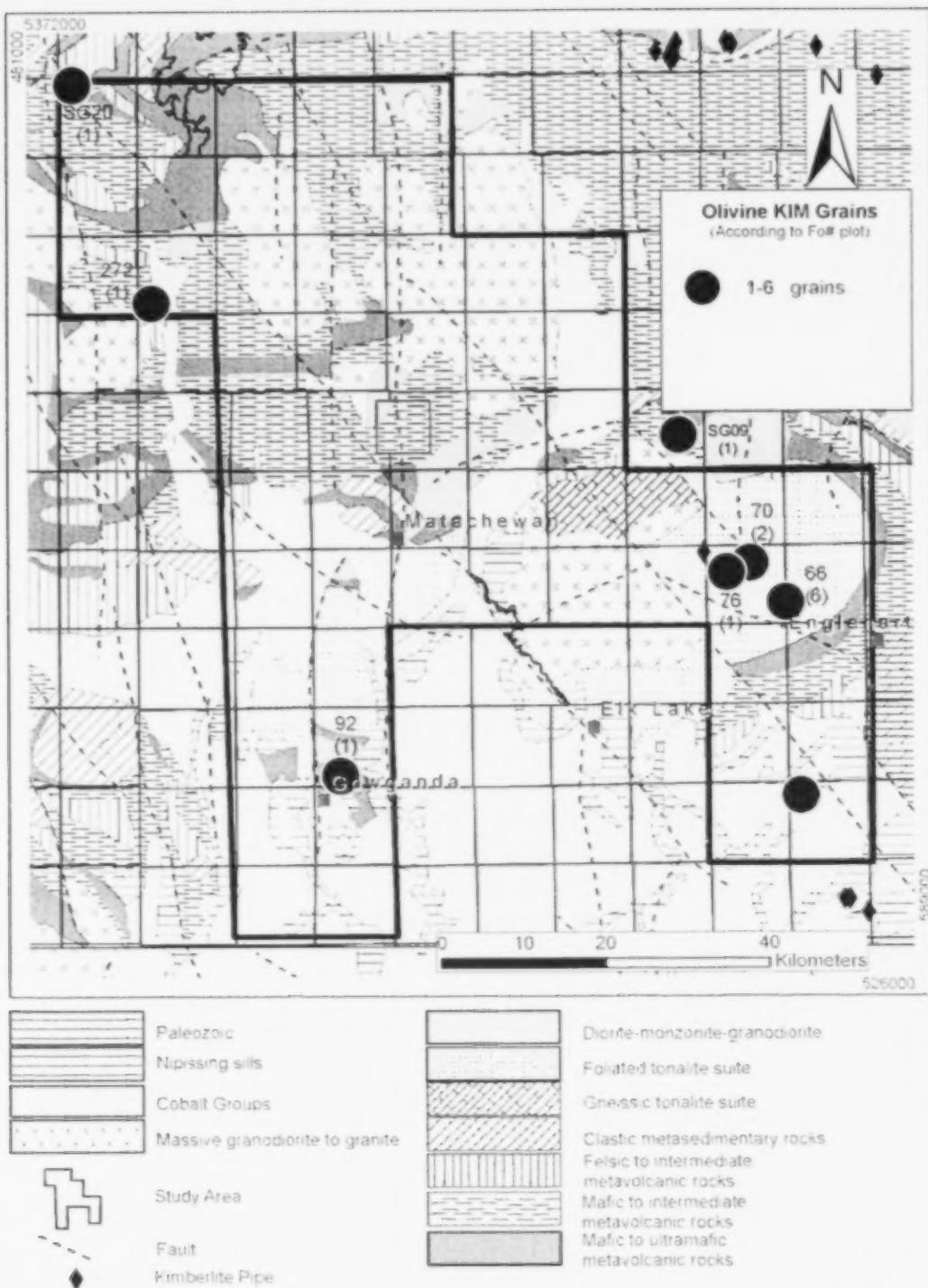


**Figure 31.** Regional distribution of olivine KIM grains according to forsterite content (Fo#) versus CaO plot (see Figure 30). Sites are labelled by sample number with corresponding number of grains shown in brackets.

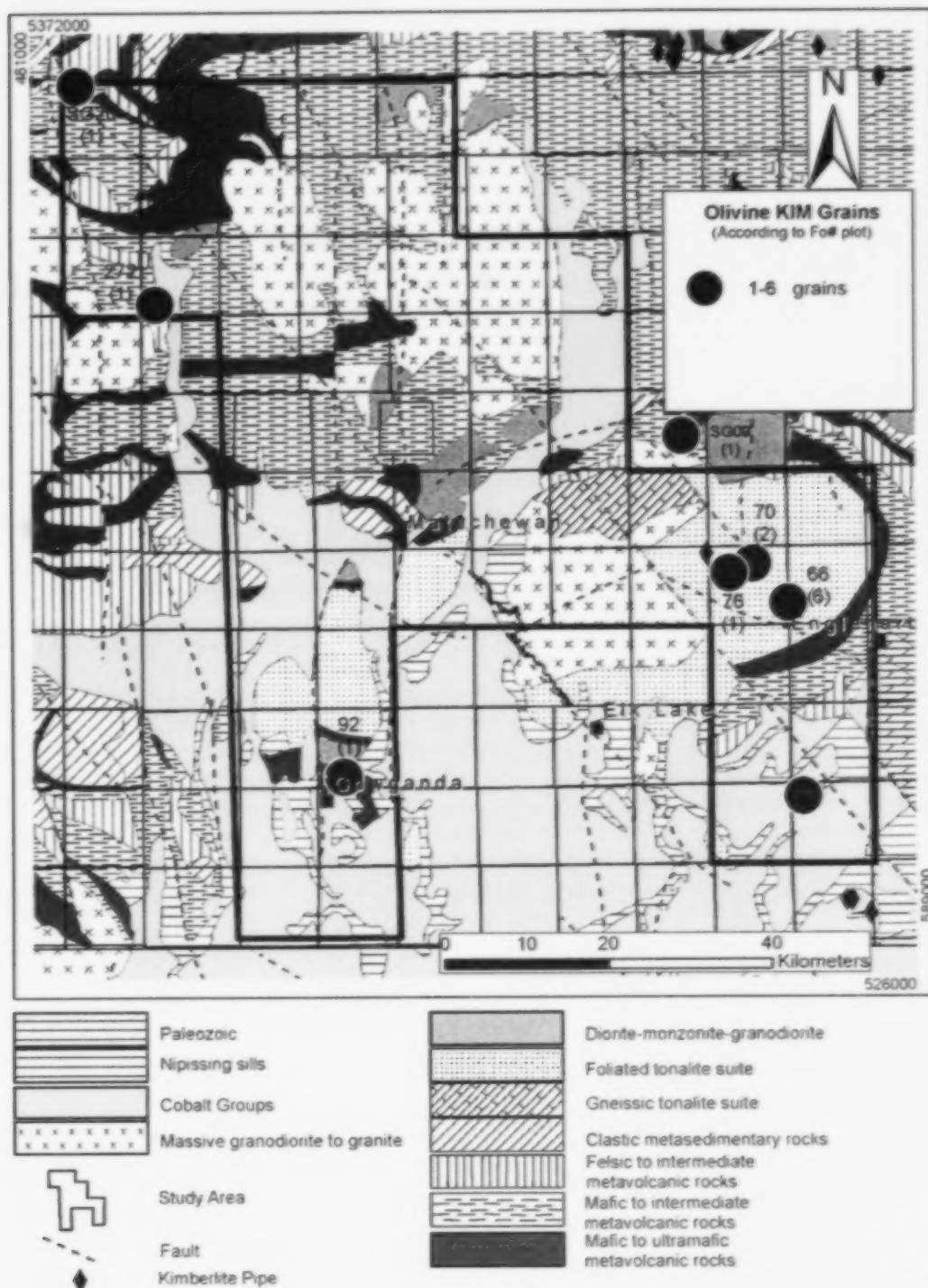


**Figure 31.** Regional distribution of olivine KIM grains according to forsterite content (Fo#) versus CaO plot (see Figure 30). Sites are labelled by sample number with corresponding number of grains shown in brackets.



## TOTAL KIMBERLITE INDICATOR MINERALS AND RECOMMENDATIONS FOR EXPLORATION

In examining the distribution and composition of kimberlite indicator minerals, several sites were identified as having anomalous numbers of KIMs. The exploration targets within the study area, discussed below, are based on sample sites containing a combination of significant KIMs such as G10 and G9 garnets, Mg-ilmenites, chromites, Cr-diopsides and olivine. Sample sites with single-mineral anomalies should be considered with caution unless they occur in the vicinity of other anomalous sites.

Diamond inclusion chromites and G10 garnets are considered to be the most significant KIMs and the best indicators of diamond potential. Figure 32 summarizes the cumulative distribution of these significant KIMs. A total of 7 grains were distributed in 6 sites: 2 grains were recovered from sample MA-167 in northeast Milner Township; 2 sites are located in northeast Beauchamp Township (MA-075 and 240); 1 site is located near Matachewan (MA-024); 1 in eastern Pacaud Township (MA-054); and 1 in northern Bannockburn Township (SG-010).

To further illustrate anomalous sites, total KIMs (all garnets, chromite KIMs, ilmenite KIMs, Cr-diopside KIMs and olivine KIMs) and total possible KIMs (total KIMs including chromites of the overlap field) have been plotted (Figures 33 and 34). Anomalous sample sites that fall within the 98th percentile in Figure 33 (total KIMs) include MA-006, 048, 052, 054, 066 and 240. These samples are located east of the Englehart River Fault with a cluster in northeastern Pacaud Township.

Anomalous sample sites that fall within the 98th percentile in Figure 34 (possible KIMs) include MA-006, 024, 043, 134, 138, 144, 185, SG-10. The overlap analytical counts were used to determine possible KIM grains, as opposed to normalized values. The number of chromite grains recovered, because of their resistive nature, tends to overwhelm the totals. A comparison of chromite possible grains (Figure 21) and possible KIM grains (Figure 34) reveals the two to be very similar. The majority of the anomalous samples are west of the Englehart River Fault, with the exception of samples MA-006 and 185.

A cluster of anomalous samples (MA-048, 052 and 054) occurs in the northeast corner of Pacaud Township (Figure 33). The area is underlain by mafic volcanic rocks in contact with the Round Lake Batholith. The compilation map by Ayer et al. (2005) indicates that the strike of the volcanic rocks and local structures is parallel to the strike of the Lake Timiskaming Structural Zone. Grabowski and Wilson (2005) reported the recovery of diamonds from lamprophyre dikes in this area. Kimberlite indicator minerals recovered included a G10 garnet, ilmenites and Cr-diopsides.

Two anomalous samples (MA-075 and 240) are located in eastern Beauchamp Township near the fault contact of Proterozoic Nipissing diabase and Paleozoic sedimentary rocks. The Lake Timiskaming West Shore Fault lies approximately under sample MA-075. Anomalous grains are garnets, chromites, ilmenites and Cr-diopsides. The diabase may be a source of ilmenite and diopside, but this does not explain the presence of the G10 garnet and diamond inclusion/intergrowth chromites.

Near Matachewan, Archean mafic volcanic rocks and Timiskaming sedimentary rocks are overlain and juxtaposed by Huronian sedimentary rocks. The Archean rocks are in contact with syenite of the Cairo Stock to the north. The northeast-trending Cadillac-Larder Lake Fault intersects the southeast-trending Montreal River Fault to the east of the village. Sample MA-024 contains a diamond inclusion/intergrowth chromite (Figure 32). A series of samples along the Montreal River Fault from northwest Baden Township to southeast Kimberley Township contain elevated numbers of chromite grains.



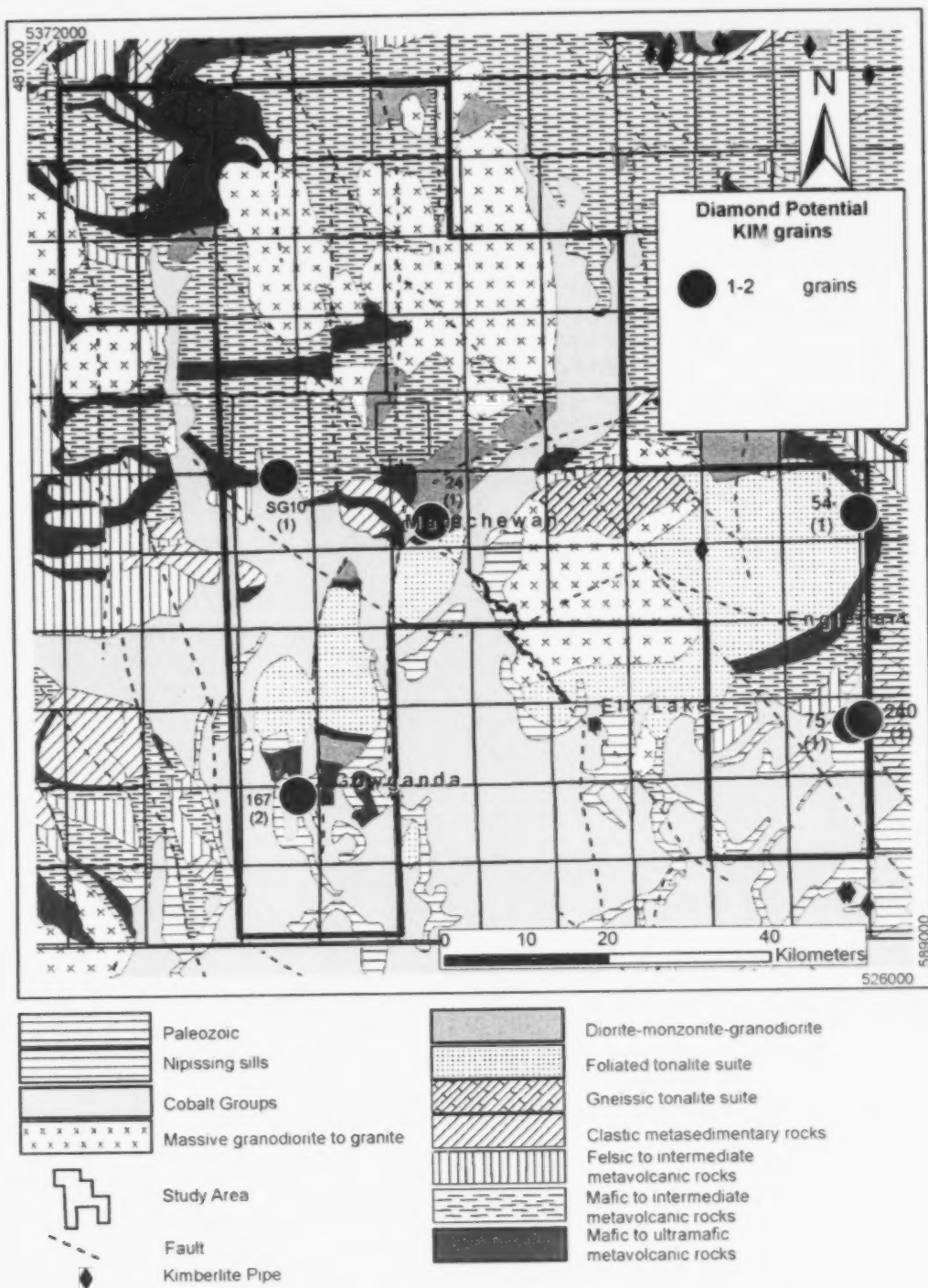


**Figure 32.** Regional distribution of diamond potential KIM grains (G10 garnet and diamond inclusion chromite grains). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

Two diamond inclusion/intergrowth chromite grains were recovered from sample MA-167 in the Gowganda area (Figure 32). The sample was collected from an area underlain by Huronian sedimentary rocks and flanked, east and west, by Nipissing diabase. Chromites were the only indicator minerals recovered possibly suggesting that the grains are not proximal.

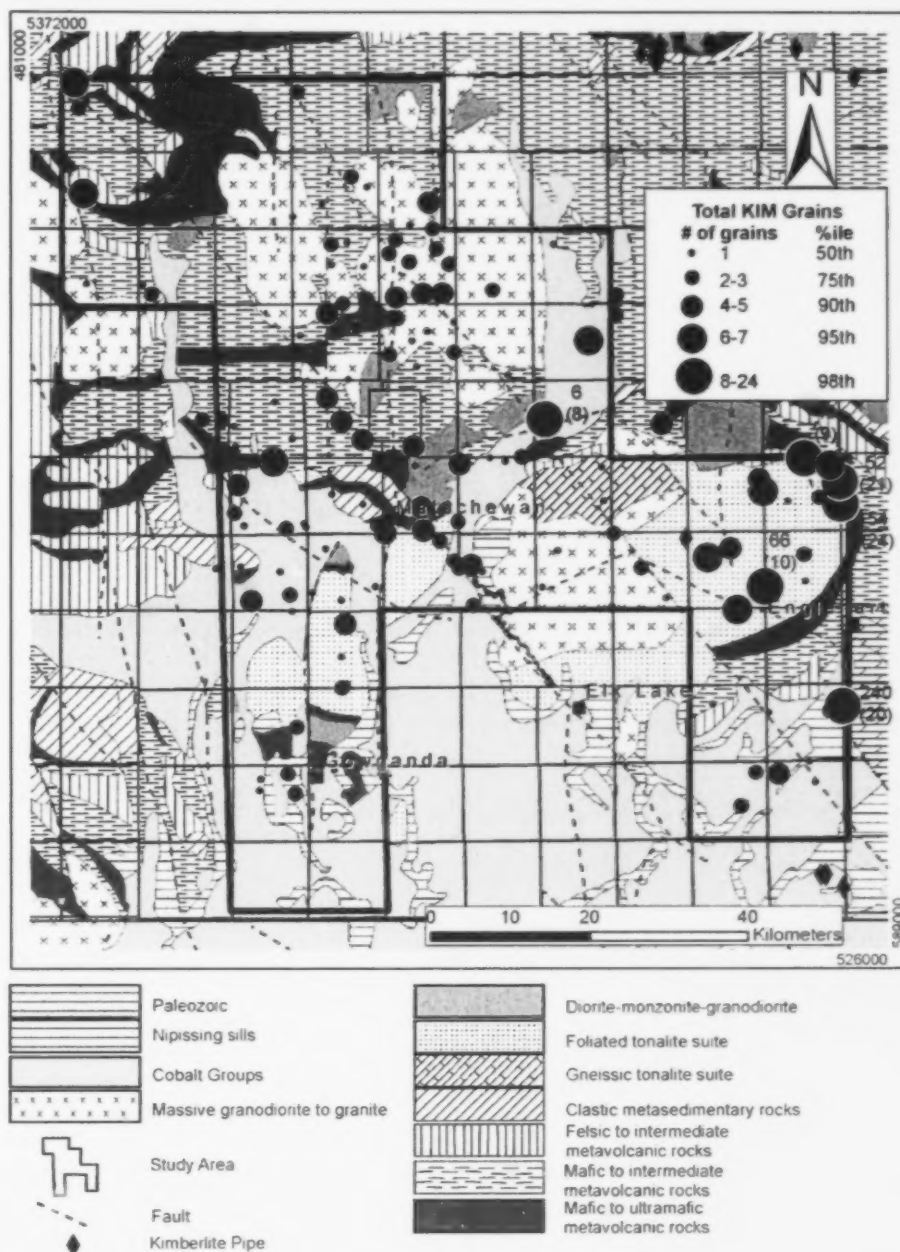


**Figure 33.** Regional distribution of total KIM grains (all garnets, chromite KIMs, ilmenite KIMs, Cr-diopside KIMs and olivine KIMs). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

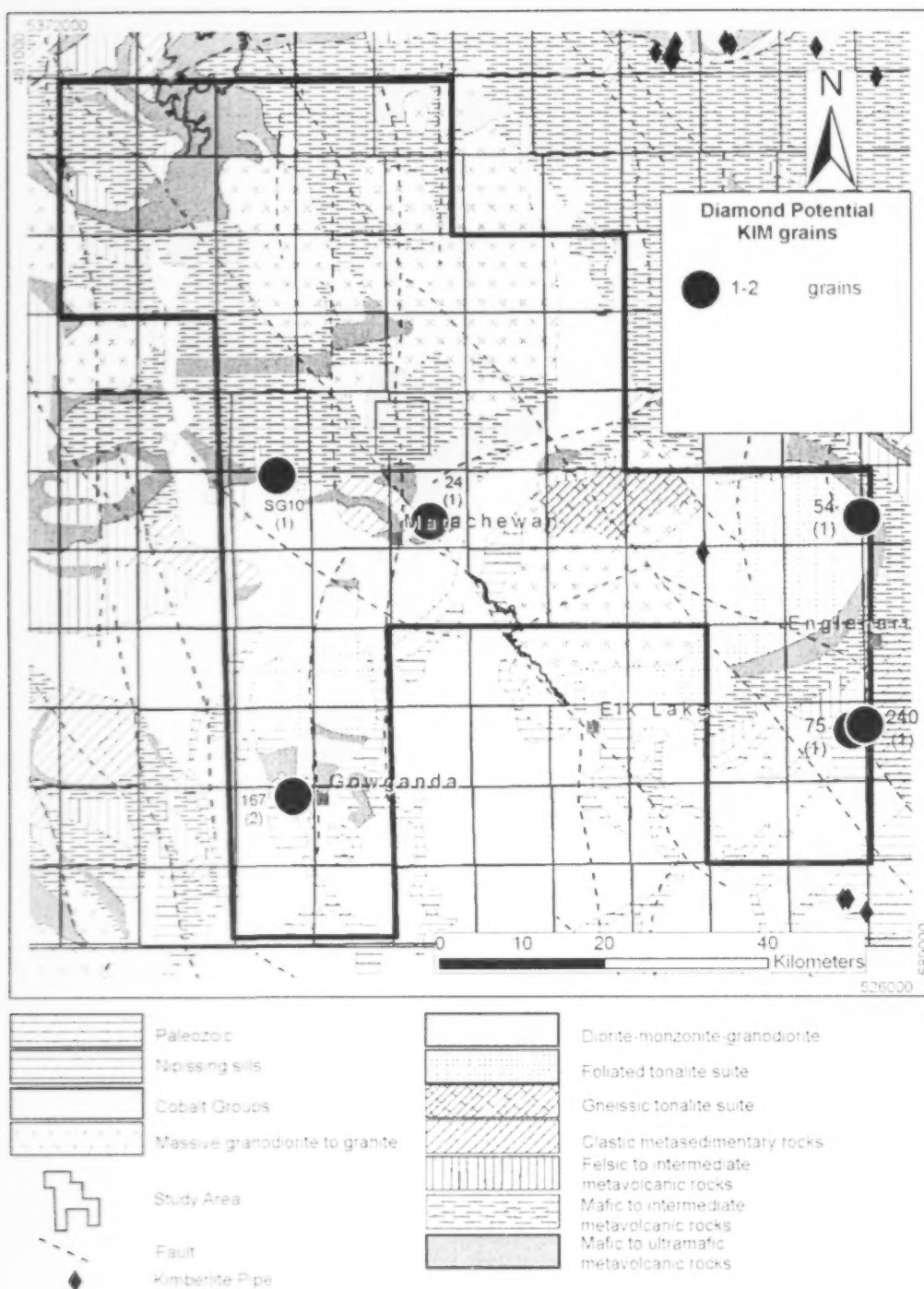


**Figure 32.** Regional distribution of diamond potential KIM grains (G10 garnet and diamond inclusion chromite grains). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

Two diamond inclusion intergrowth chromite grains were recovered from sample MA-167 in the Gowganda area (Figure 32). The sample was collected from an area underlain by Huronian sedimentary rocks and flanked, east and west, by Nipissing diabase. Chromites were the only indicator minerals recovered possibly suggesting that the grains are not proximal.

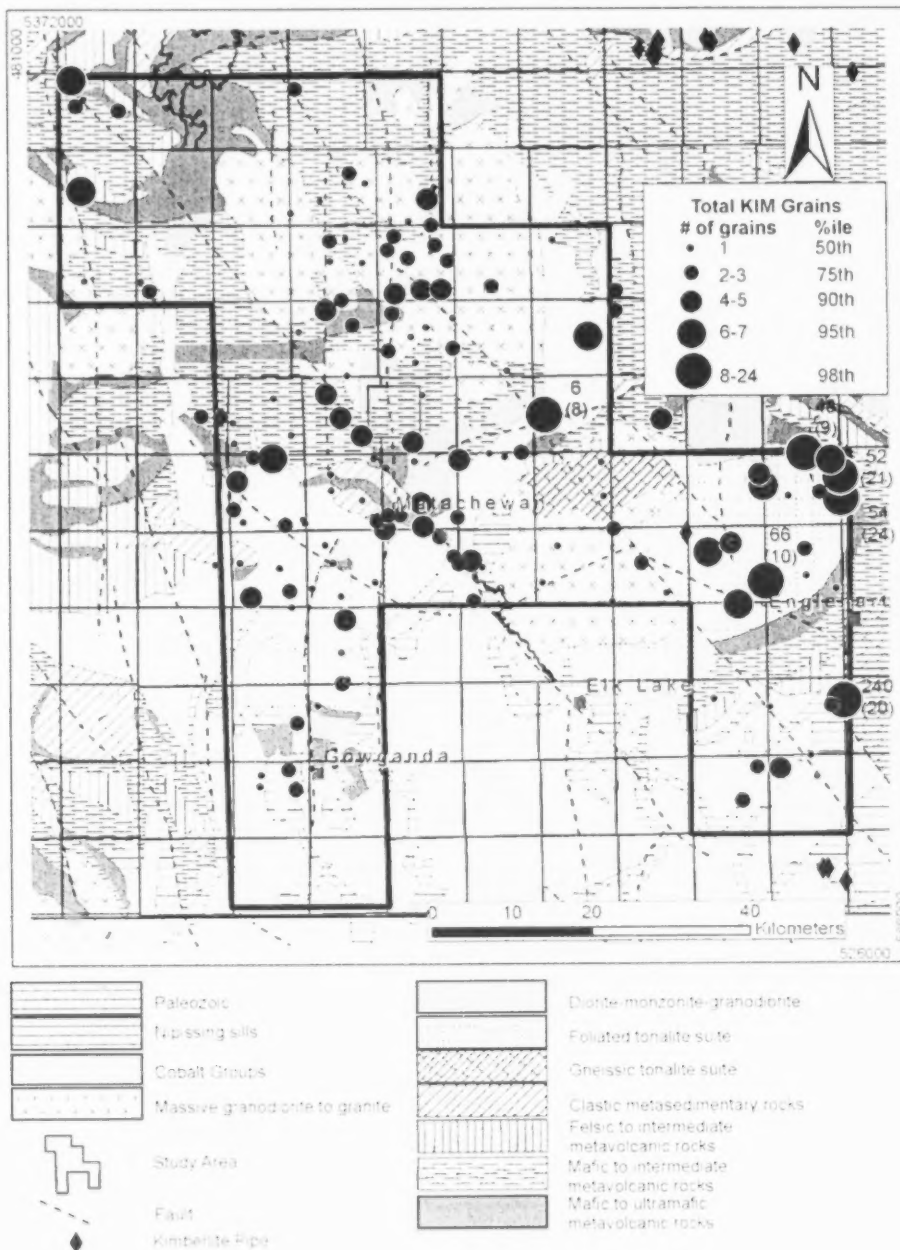


**Figure 33.** Regional distribution of total KIM grains (all garnets, chromite KIMs, ilmenite KIMs, Cr-dropside KIMs and olivine KIMs). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

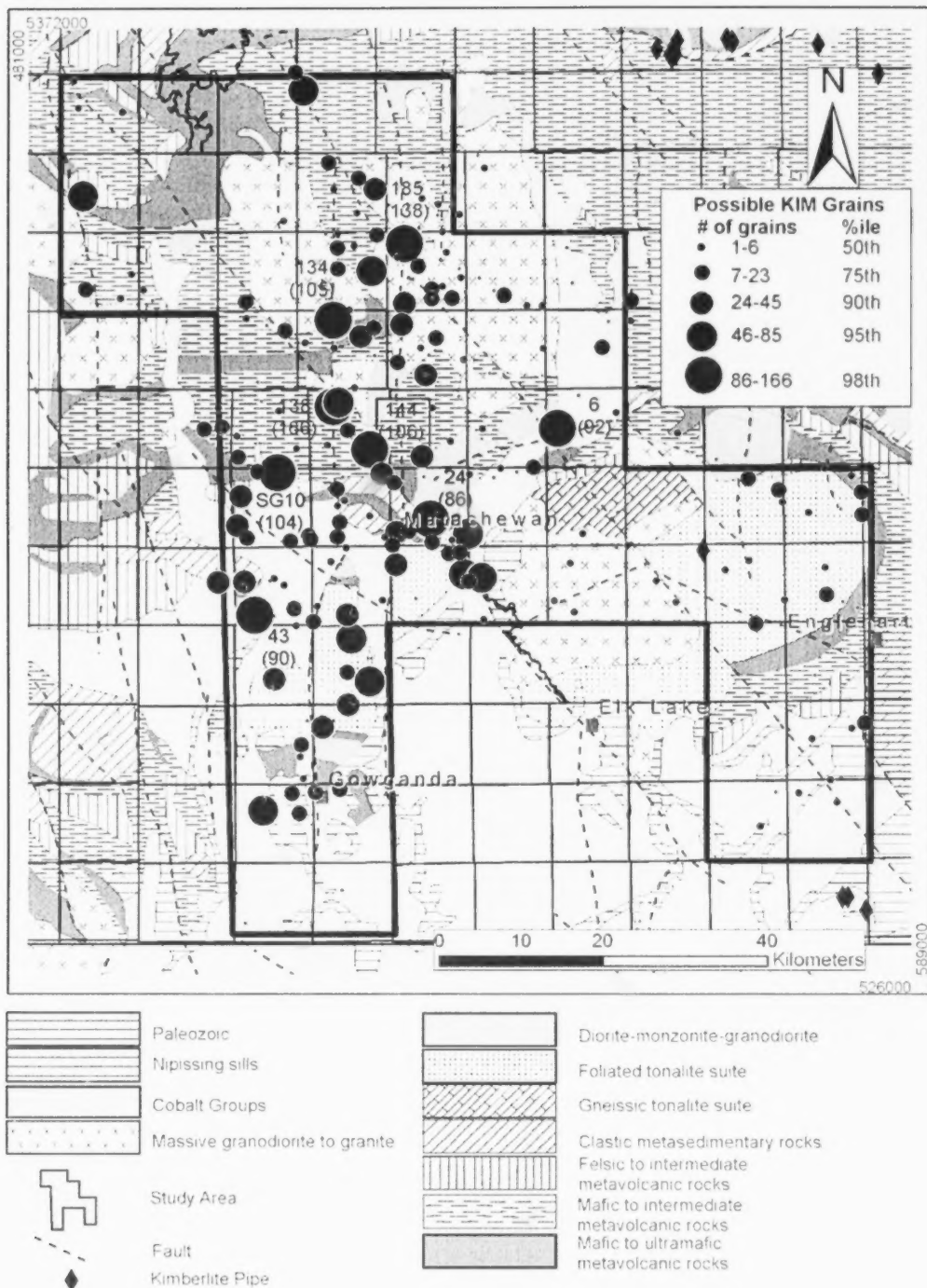


**Figure 34.** Regional distribution of total possible KIM grains (includes total KIMs as well as overlap field chromites). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.



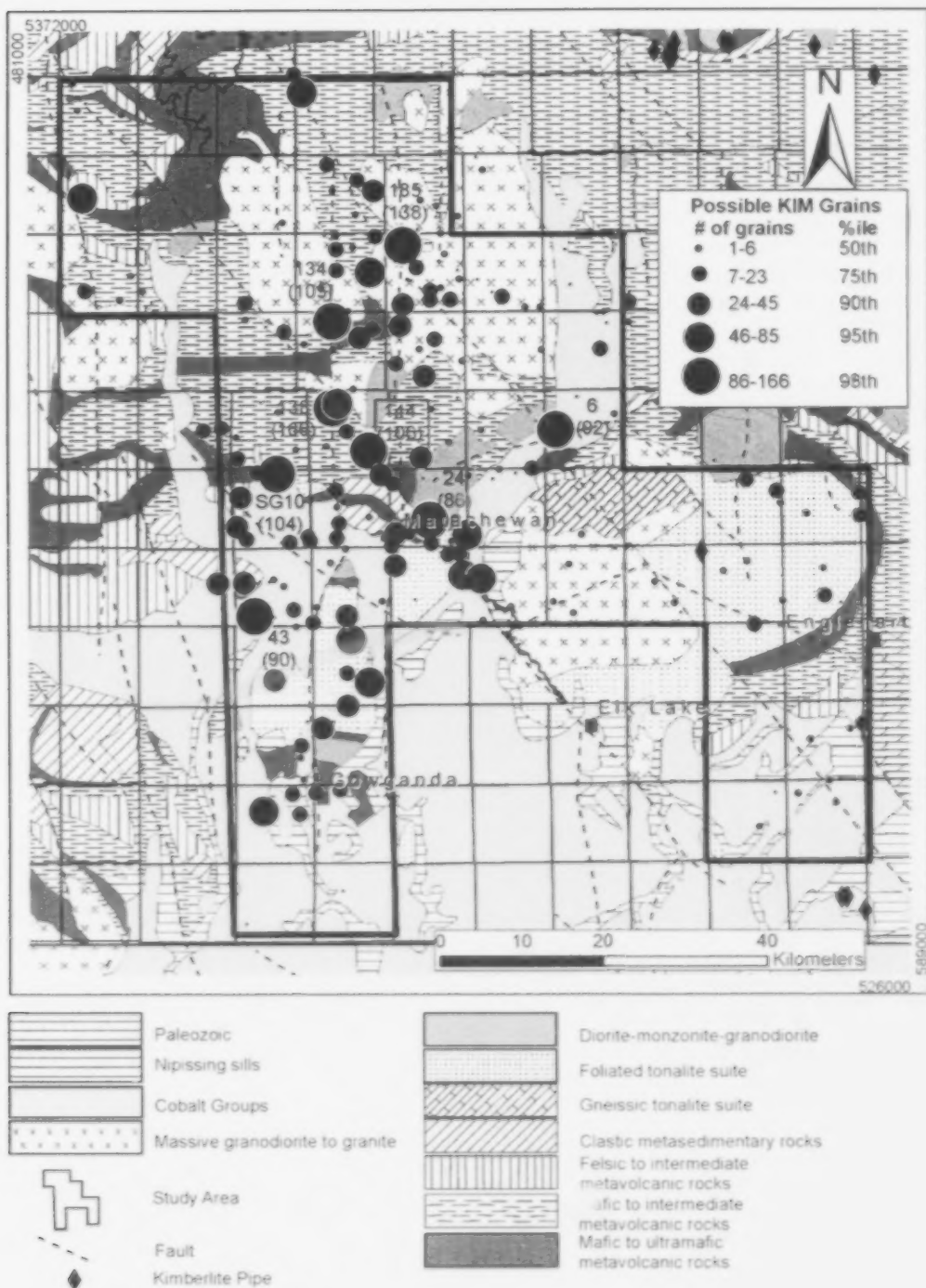


Figure 34. Regional distribution of total possible KIM grains (includes total KIMs as well as overlap field chromites). Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.



Because of its susceptibility to weathering, the presence of Cr-diopside can be used as a measure of proximity to source. This mineral disappears quickly once transported from source. Therefore, its recovery in a sample may suggest local derivation. The Al-Na-Cr ternary plot (see Figure 22) for Cr-diopside indicated that a large number of grains could be classified as kimberlitic. When the grains were plotted, 2 clusters of anomalies are evident: one in northeast Pacaud Township, and the other in Nordica and McEvay townships, underlain by the Watabeag Batholith (Figure 23).

To further assess proximity to source, pebble lithology studies can be used. All rock types found as pebbles in the modern alluvium samples are either present within or found immediately up-ice from the study area thus providing a level of support for the assertion that transport distances are limited. Further detail regarding pebble lithology is found in the pebble data section of this report and in Appendix J.

The types of surficial deposits in the study area can provide some indication of local or distal derivation of the KIMs in the anomalies identified. Samples MA-006, 024, 167 are within areas of thin overburden. Sample SG-10 is found within glaciofluvial outwash, and samples MA-048, 052, 054, 075 and 240 were recovered from areas of glaciolacustrine deposits. In general, areas of thin overburden are located in an up-ice direction and within a few kilometres of these latter group of samples.

## **METAMORPHIC/MAGMATIC MASSIVE SULPHIDE INDICATOR MINERALS**

Metamorphic/magmatic massive sulphide indicator minerals (MMSIMs) are stable heavy minerals that occur in alteration zones associated with volcanogenic massive sulphide deposits (MVMS) in high-grade terranes; in magmatic Ni-Cu sulphide deposits (Mag Ni-Cu); and in skarn and greisen deposits (Averill 1999). The heavy mineral assemblages associated with each of these deposit types are listed in Table 1. Identifying MMSIMs in overburden deposits is useful as they are coarse-grained, unique to the types of mineralization listed above, visually distinctive, easy to concentrate due to their specific gravity (>3.2), amenable to paramagnetic separation, and they are relatively resistant to weathering in the secondary environment (Averill 1999).

Common mineral associations in VMS type dispersion trains are gahnite-barite, chalcopyrite-spessartine (Mn-epidote), gahnite-chalcopyrite-staurolite (or anthophyllite) and red rutile-spinel-kyanite (or sillimanite). Gahnite is probably the most important MMSIM associated with VMS-type dispersions since it is enriched in the ore metal zinc and is extremely stable in the secondary environment. Other MMSIMs associated with VMS deposits include kyanite, sillimanite, staurolite and orthopyroxene.

Magmatic Ni-Cu indicator minerals are characterised by distinctive Cr-rich phases, such as Cr-diopside, chromite, uvarovite and Cr-rutile (Ontario Geological Survey 2001). Averill (1999) suggests that these phases are produced as a result of the separation of Ni-Cu-Fe-S liquids from ultramafic magmas, which results in the subsequent enrichment of Mg, Fe, Cr, Al and Si in the residual melt. Other minerals associated with these deposits include chalcopyrite, forsteritic olivine, Mg-orthopyroxene and PGE alloys (Ontario Geological Survey 2001).

Many of these minerals occur as common components in non-mineralized rocks, presenting a challenge in dealing with this complex group of minerals (Crabtree 2003). Averill (1999) suggests that olivine, orthopyroxene, chromite and Cr-diopside occurrences in alluvial samples should only be emphasized if other more diagnostic minerals are present. Crabtree (2003) notes that sulphides are not particularly stable in the secondary environment, however, chalcopyrite and sphalerite are nominally stable in postglacial terrains. It seems logical, therefore, to evaluate these occurrences together with more stable ore-enriched phases, such as gahnites, whenever they occur.

**Table 1.** List of indicator minerals found in the survey area and the associated base metal mineralization style (after Averill 1999). The presence of a mineral species is indicated by a shaded rectangle.

| Indicator Mineral   | MVMS | Mag Ni-Cu | Skarn | Greisen | Other Occurrence       |
|---------------------|------|-----------|-------|---------|------------------------|
| chalcopyrite        |      |           |       |         |                        |
| chromite            |      |           |       |         | Mafic igneous          |
| corundum            |      |           |       |         | High-grade metamorphic |
| Cr-rutile           |      |           |       |         |                        |
| forsteritic olivine |      |           |       |         |                        |
| gahnite             |      |           |       |         |                        |
| grossular           |      |           |       |         |                        |
| kyanite             |      |           |       |         | High-grade metamorphic |
| low Cr-diopside     |      |           |       |         | Mafic igneous          |
| molybdenite         |      |           |       |         |                        |
| Mn-epidote          |      |           |       |         |                        |
| native gold         |      |           |       |         |                        |
| olivine             |      |           |       |         | Mafic igneous          |
| orthopyroxene       |      |           |       |         | High-grade metamorphic |
| pyrite              |      |           |       |         |                        |
| sillimanite         |      |           |       |         | High-grade metamorphic |
| spessartine         |      |           |       |         | Metavolcanics          |
| staurolite          |      |           |       |         | High-grade metamorphic |
| uvarovite           |      |           |       |         |                        |
| anthophyllite       |      |           |       |         | High-grade metamorphic |
| Mg-spinel           |      |           |       |         | High-grade metamorphic |
| sapphirine          |      |           |       |         | High-grade metamorphic |
| dumortierite        |      |           |       |         |                        |
| franklinite         |      |           |       |         |                        |
| willemitite         |      |           |       |         |                        |
| barite              |      |           |       |         |                        |
| cinnabar            |      |           |       |         |                        |
| loellingite         |      |           |       |         |                        |
| tourmaline          |      |           |       |         |                        |
| hercynite           |      |           |       |         |                        |
| rammelsbergite      |      |           |       |         |                        |
| sperrylite          |      |           |       |         |                        |
| vesuvianite         |      |           |       |         |                        |
| johannsenite        |      |           |       |         |                        |
| scheelite           |      |           |       |         |                        |
| topaz               |      |           |       |         |                        |
| fluorite            |      |           |       |         |                        |
| cassiterite         |      |           |       |         |                        |
| wolframite          |      |           |       |         |                        |

## Cr-Diopside

Averill (1999) has suggested that low Cr-diopsides are an important indicator mineral for magmatic Ni-Cu mineralization with two notable examples of this association occurring at Thompson, Manitoba and Outokumpu, Finland. Clinopyroxene is one of the first minerals to crystallize from a mafic/ultramafic melt. If its formation precedes chromite, Cr in the melt may initially be incorporated into the diopside structure. However, clinopyroxene crystallization occurring after chromite can still produce Cr-diopside. The silicate melt will eventually be Fe-depleted due to the formation of Ni-Cu minerals and chromite crystallization will cease, allowing any excess Cr to be included in diopside. Only those Cr-diopsides plotting outside the kimberlite field defined on a Cr-Al-Na ternary diagram are considered as potential MMSIMs as shown on Figure 23. These grains are further subdivided based on their  $\text{Cr}_2\text{O}_3$  wt % values. Cr-diopsides with less than 1.5 wt %  $\text{Cr}_2\text{O}_3$  were considered to be MMSIMs (Morris et al. 2000).

## Chromite

During fractional crystallization of mafic and ultramafic magmas, chromite is one of the earliest minerals to appear and often forms layered cumulates at the base or within the solidified melt. Chromite is a primary component of many mafic and ultramafic layered intrusions that are host to Ni-Cu mineralization, for instance the Bushveld Complex, South Africa; Skaergaard Intrusion, Greenland; Stillwater Complex, Montana; and Muskox Intrusion, NWT. As well, chromite occurs in komatiitic flows that host Ni-sulphide mineralization (Kambalda, Australia; Nor'il'sk, Russia).

Those chromites that plot in the non-lamproitic/kimberlitic field and the overlap field of the Fipke, Gurney and Moore (1995)  $\text{Cr}_2\text{O}_3$ - $\text{TiO}_2$  plot were considered to be MMSIMs as shown on Figure 21.

## OTHER METAMORPHIC/MAGMATIC MASSIVE SULPHIDE INDICATOR MINERALS

The formation of Ni-Cu sulphide minerals removes Fe from crystallizing mafic/ultramafic melts, resulting in the formation of Mg-rich olivines and Mg-rich orthopyroxenes. The conclusion of chromite crystallization resulting from the lack of Fe allows excess Cr in the melt to be incorporated into red rutile and uvarovite (Averill 1999).

Picking results for MMSIMs were reported in 3 ways: actual grain counts (e.g., chalcopyrite or low Cr-diopside); percentages of the total fraction size (e.g., orthopyroxene); or as trace amounts (e.g., staurolite). In order to determine the distribution of sites with anomalous MMSIMs, a ranking system was designed to analyse the data in a uniform manner. Minerals present in trace amounts were assigned values representing half of the lowest reported amount, 0.25%. The sites were then ranked from 5 to 0 depending upon the number of anomalous (anomalous defined as >95<sup>th</sup> percentile) MMSIMs determined for each site. For example, sample MA-144 has the highest number (5) of different anomalous MMSIMs (chromite, chalcopyrite, gahnite, corundum and staurolite). Site MA-174 was given a ranking of 4 as it consisted of 4 different types of anomalous MMSIMs (chalcopyrite, pyrite, corundum and fayalite). Results of this ranking system were used to produce an MMSIM proportional dot diagram summarizing the distribution of those sites with the highest number of anomalous MMSIMs. Above the 95<sup>th</sup> percentile, 10 sites ranked at 3 to 5 (Table 2) and 108 sites ranked below the 95<sup>th</sup> percentile, at 1 or 2. The regional distribution of the anomalies is shown in Figure 35.

**Table 2.** Summary of MMSIMs picked and anomalous MMSIM sites (see text for rankings system). Actual grain numbers are shown unless otherwise stated (i.e., %). Samples ranked 3 to 5 are above the 95<sup>th</sup> percentile for all sites.

| Sample Number | Minerals 0.25 to 0.5 mm |      |     |      |     |         |     |       |      |       |      |       |       |       |   | Rank |
|---------------|-------------------------|------|-----|------|-----|---------|-----|-------|------|-------|------|-------|-------|-------|---|------|
|               | Low Cr-diop             | Chr  | Cpy | Py   | Ghn | Cr-gros | Cor | % Gth | % Ky | % Sil | % St | % Sps | % Fay | % Opx |   |      |
| 03-JR-MA-144  | 10                      | 2000 | 5   | 0    | 2   | 0       | 2   | 0     | 0.25 | 0.25  | 2    | 0     | 0.25  | 2     | 5 |      |
| 03-JR-MA-025  | 17                      | 5000 | 1   | 5    | 1   | 0       | 1   | 0.25  | 0.25 | 0.25  | 0.25 | 0     | 0     | 3     | 4 |      |
| 03-JR-MA-174  | 1                       | 150  | 29  | 1000 | 0   | 0       | 3   | 0.25  | 0    | 0     | 1    | 0     | 15    | 0.25  | 4 |      |
| 03-JR-MA-292  | 1                       | 1000 | 0   | 2    | 1   | 0       | 0   | 0     | 0    | 0.25  | 0.25 | 0.25  | 4     | 0.25  | 4 |      |
| 03-JR-MA-138  | 9                       | 7000 | 7   | 2    | 1   | 0       | 1   | 0     | 0.25 | 0.25  | 0.25 | 0     | 0     | 0     | 4 |      |
| 03-JR-SG-016  | 0                       | 120  | 10  | 10   | 0   | 1       | 0   | 0.25  | 0    | 0     | 0.25 | 0     | 5     | 2     | 3 |      |
| 03-JR-MA-146  | 16                      | 9    | 0   | 0    | 0   | 0       | 1   | 0     | 0    | 0.25  | 2    | 0     | 0     | 2     | 3 |      |
| 03-JR-MA-006  | 23                      | 500  | 1   | 3    | 4   | 0       | 0   | 0     | 0.25 | 0.25  | 1    | 0     | 0     | 0.25  | 3 |      |
| 03-JR-MA-110  | 5                       | 300  | 19  | 25   | 2   | 0       | 1   | 0     | 0.25 | 0.25  | 0.25 | 0     | 0     | 0.25  | 3 |      |
| 03-JR-MA-042  | 26                      | 50   | 2   | 10   | 0   | 0       | 0   | 0     | 0.25 | 0.25  | 2    | 0     | 0.5   | 0.5   | 3 |      |

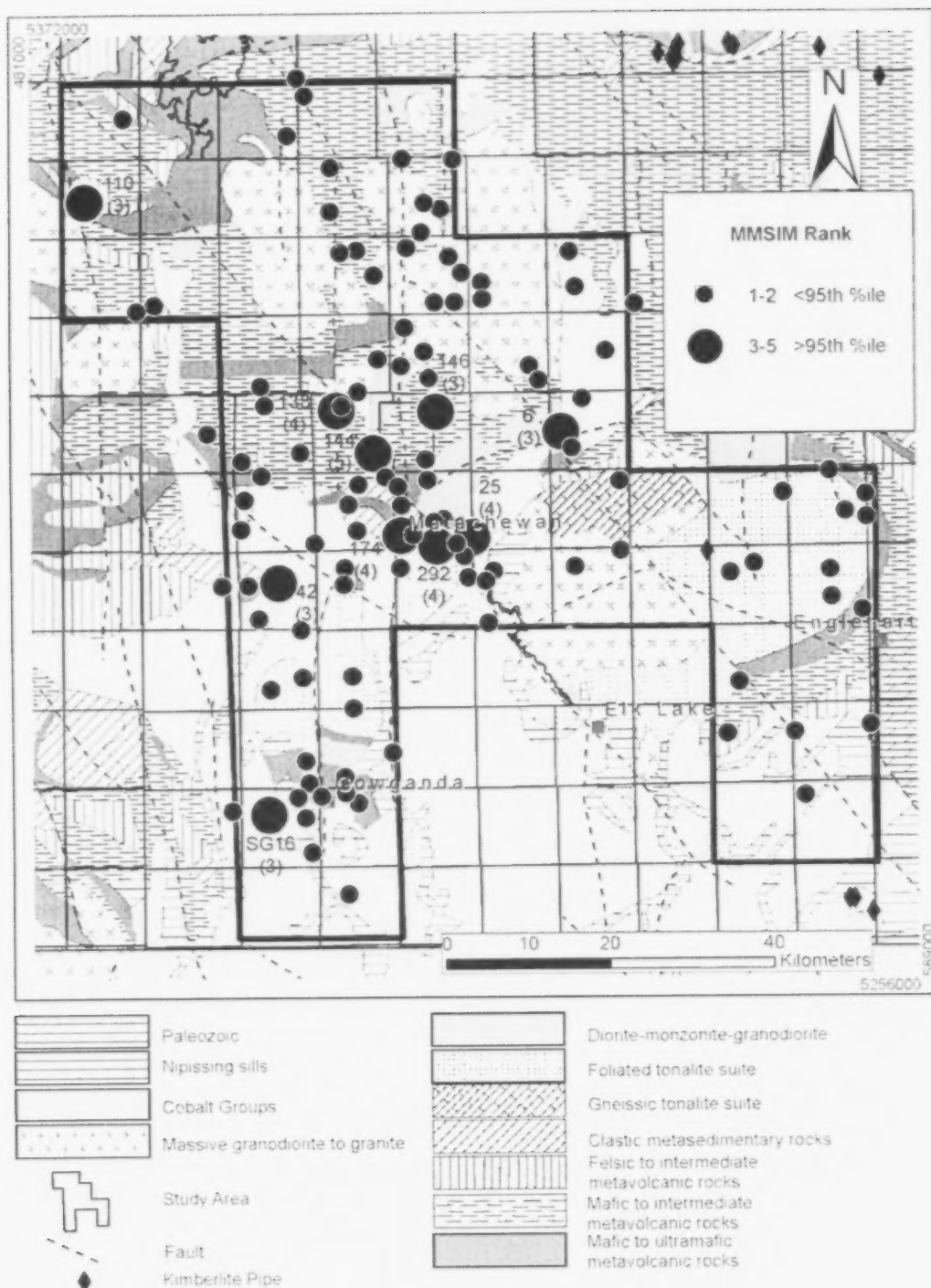


**Figure 35.** Regional distribution of MMSIM indicators. Anomalous sites are denoted by sample number, rank of these sites is shown in brackets (ranking methodology is described in text).

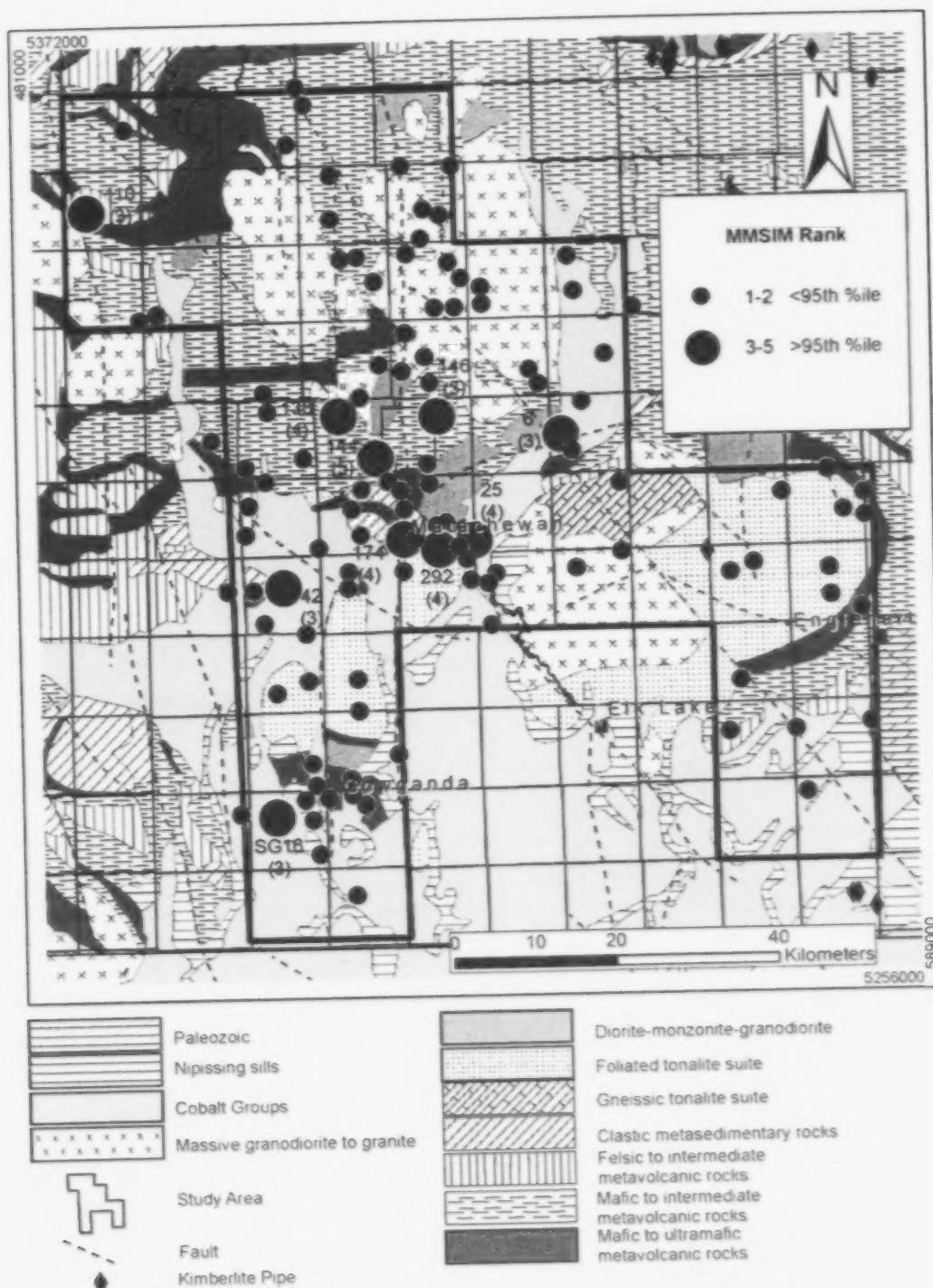


**Figure 35.** Regional distribution of MMSIM indicators. Anomalous sites are denoted by sample number, rank of these sites is shown in brackets (ranking methodology is described in text).



Anomalous MMSIM sites are located, mainly, within the western part of the study area. However, sites containing MMSIMs are evenly distributed throughout the entire survey area. The MMSIM anomalies could occur in various geological environments. Polymetallic occurrences of metals including Cu, Co, Ag, Au, Zn, Pb and Ni are known to be either hosted within the margins of the Nipissing diabase or within sedimentary rocks adjacent to diabase sills. The mafic and ultramafic rocks of the Nipissing diabase, Sudbury swarm and related intrusive rocks may have pods of magmatic Ni-Cu massive sulphides. As well, small quartz-carbonate veins containing anomalous values of Cu, Ag, Co  $\pm$  Au, Ni may occur in the region. The emplacement of Archean mafic and felsic intrusives or Proterozoic mafic intrusives may have liberated hydrothermal fluids that remobilized metals from the metavolcanics or Huronian sediments. Consequently, these fluids could have deposited the sulphides in quartz-carbonate veins in any of the rock formations present in the vicinity as they travelled along structural contacts or fault zones. Later metamorphism could have resulted in the genesis of similar veins. Sulphide veins in rhyolites and related felsic volcanic rock types may represent zones of volcanogenic massive sulphides with minor copper and zinc mineralization (Born 1989). Matachewan is host to 2 past-producing gold mines with low tenors of base metals. Anomalous sample MA-110 is located in the vicinity of the past-producing Redstone nickel mine in Eldorado Township.

## GOLD

Gold grains recovered from modern alluvium samples are typically silt sized and were classified according to their grain shape. The shape varies depending on the distance of transport from their source area. The gold grain shape classification is based on Dilabio (1990) and uses the terms pristine, modified and reshaped. In general, pristine grains appear as angular wires or rods and thus retain primary textures such as crystal faces, suggesting little distance of transport from the source. Modified grains retain the original shape but have irregular edges and crumpled or curled protrusions. Reshaped grains indicate a longer distance of transport from source therefore appearing flattened or rounded, retaining little or none of their original form (DiLabio 1990).

Gold grain data for the 357 samples collected are listed in Appendix F in MRD 129. A total of 772 gold grains were recovered, of which 153 were pristine, 96 were modified and 523 were reshaped. The majority of grains were reshaped, suggesting some distance of transport. Table 3 lists the samples that fall within the 90<sup>th</sup>, 95<sup>th</sup> and 98<sup>th</sup> percentiles and the shapes of visible gold grains. Grains were recovered from only 194 of the sites sampled. Only 17 samples were considered anomalous, 8 above the 98<sup>th</sup> percentile (15 to 66 grains) and 9 above the 95<sup>th</sup> percentile (7 to 13 grains) (Figure 36).

Anomalous gold grain sites (>95<sup>th</sup> percentile) are distributed predominantly on a westerly trend through the central portion of the survey area. Anomalous samples MA-046 and 050 may be related to gold deposits in the Boston Creek area. Samples TM-02, SG-13, SG-15 and MA-309 are located in the vicinity of the Matachewan gold deposits. Sample MA-049 is located near a known gold showing in southwestern Pacaud Township. Samples MA-104 and 210 are located near the Timmins gold deposits.

Other samples are not as easily explained. Gold mineralization in the Matachewan area is generally associated with quartz veins and feldspar porphyry dikes occupying shear zones or fractures within the metavolcanic rocks or epizonal intrusions (Pyke 1978). Additionally, occurrences of gold mineralization are found within the Round Lake Batholith. According to Ayer and Trowell (2000) there is known gold mineralization within the felsic to intermediate intrusive rocks of the Round Lake Batholith. It is possible that the anomalous gold grain sites may be related to this mineralization.



**Table 3.** Summary of gold grains recovered from samples.

| Sample Number   | Number of Visible Gold Grains |          |          |          | Underlying Rock Type      |
|-----------------|-------------------------------|----------|----------|----------|---------------------------|
|                 | Total                         | Reshaped | Modified | Pristine |                           |
| 98th percentile |                               |          |          |          |                           |
| 03-JR-MA-050    | 66                            | 35       | 17       | 14       | mafic volcanic            |
| 03-JR-SG-013    | 43                            | 24       | 7        | 12       | felsic intrusive          |
| 03-JR-TM-002    | 42                            | 19       | 12       | 11       | sedimentary               |
| 03-JR-SG-015    | 31                            | 4        | 1        | 26       | felsic intrusive          |
| 03-JR-MA-037    | 23                            | 15       | 4        | 4        | Nipissing mafic intrusive |
| 03-JR-MA-210    | 21                            | 9        | 1        | 11       | mafic volcanic            |
| 03-JR-MA-125    | 18                            | 12       | 2        | 4        | felsic intrusive          |
| 03-JR-MA-173    | 15                            | 7        | 1        | 7        | sedimentary               |
| 95th percentile |                               |          |          |          |                           |
| 03-JR-MA-049    | 13                            | 10       | 3        | 0        | felsic intrusive          |
| 03-JR-MA-046    | 10                            | 8        | 0        | 2        | felsic intrusive          |
| 03-JR-MA-244    | 10                            | 4        | 1        | 5        | felsic intrusive          |
| 03-JR-MA-108    | 9                             | 7        | 1        | 1        | mafic volcanic            |
| 03-JR-MA-145    | 9                             | 8        | 1        | 0        | felsic intrusive          |
| 03-JR-MA-104    | 8                             | 8        | 0        | 0        | felsic intrusive          |
| 03-JR-MA-166    | 7                             | 2        | 4        | 1        | Huronian Supergroup       |
| 03-JR-MA-274    | 7                             | 4        | 3        | 0        | mafic volcanic            |
| 03-JR-MA-309    | 7                             | 4        | 1        | 2        | Nipissing mafic intrusive |
| 90th percentile |                               |          |          |          |                           |
| 03-JR-MA-034    | 6                             | 4        | 2        | 0        | Huronian Supergroup       |
| 03-JR-MA-035    | 6                             | 3        | 3        | 0        | felsic intrusive          |
| 03-JR-MA-058    | 6                             | 6        | 0        | 0        | felsic intrusive          |
| 03-JR-MA-059    | 6                             | 5        | 1        | 0        | mafic volcanic            |
| 03-JR-MA-070    | 6                             | 4        | 0        | 2        | felsic intrusive          |
| 03-JR-SG-010    | 6                             | 6        | 0        | 0        | mafic volcanic            |
| 03-JR-MA-149    | 6                             | 4        | 2        | 0        | felsic volcanic           |
| 03-JR-MA-281    | 6                             | 5        | 0        | 1        | intermediate volcanic     |
| 03-JR-MA-302    | 6                             | 5        | 0        | 1        | intermediate volcanic     |

## Pebble Data

Pebble data is available for 38 sample sites throughout the study area. Most of the bedrock terrane within the survey area is made up of the Cobalt Group sediments and Nipissing diabase in the south, granitic rocks of the Round Lake and Watabeag batholiths in the eastern portion, and mafic volcanic and Archean sedimentary rocks elsewhere. Mafic volcanic rocks of the Abitibi greenstone belt underlie a large area, to the north and northwest of the survey area. It is not surprising, then, to find that, in general, the percentage of mafic volcanic pebbles recovered from sample sites are highest regardless of the bedrock terrane over which sediments were collected. In the few cases where gneissic pebbles were dominant, it is likely that they are associated with the margins of the Round Lake Batholith. A complete summary of pebble lithology counts for sample sites is included in Appendix J.

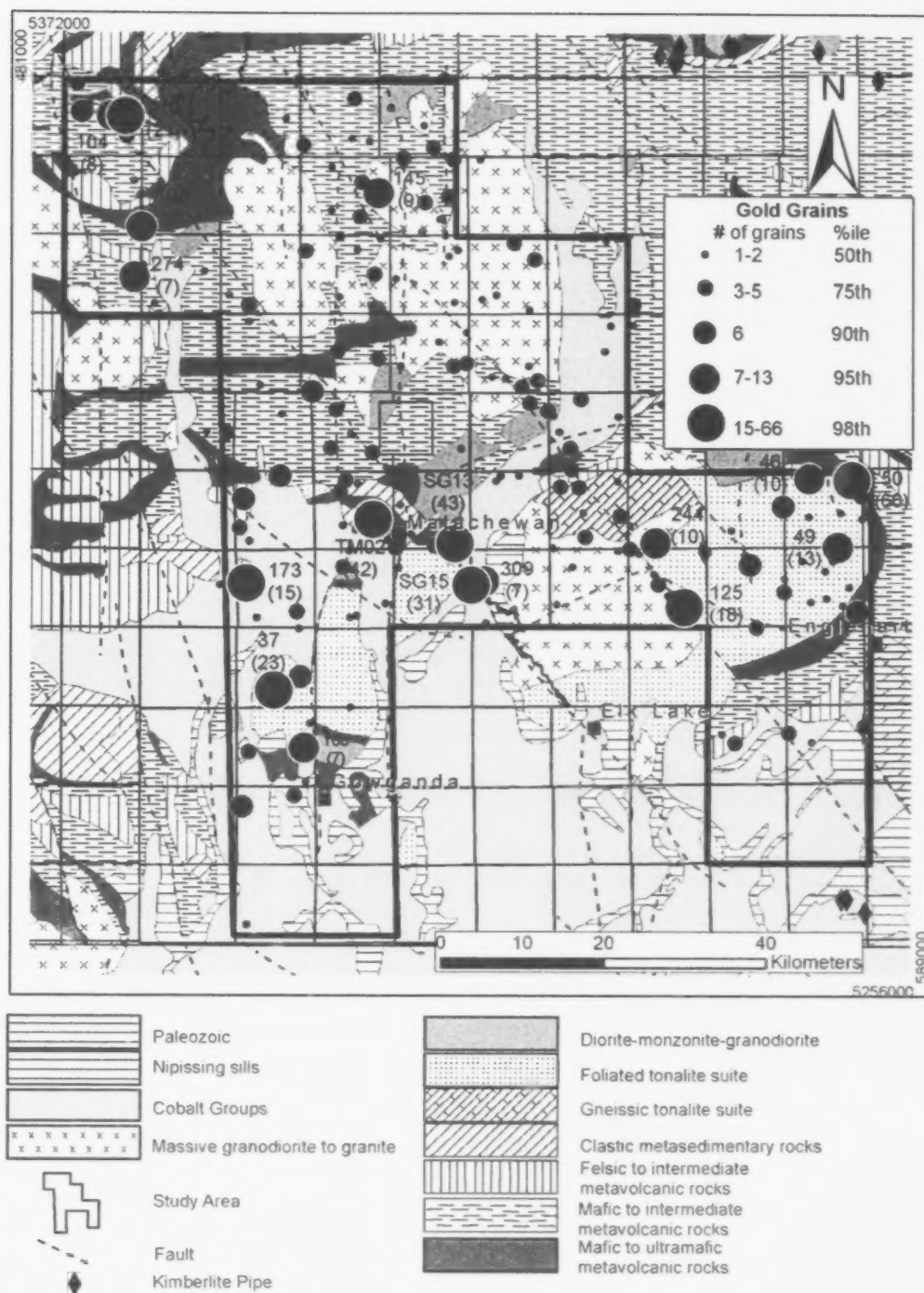


Figure 36. Regional distribution of gold grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

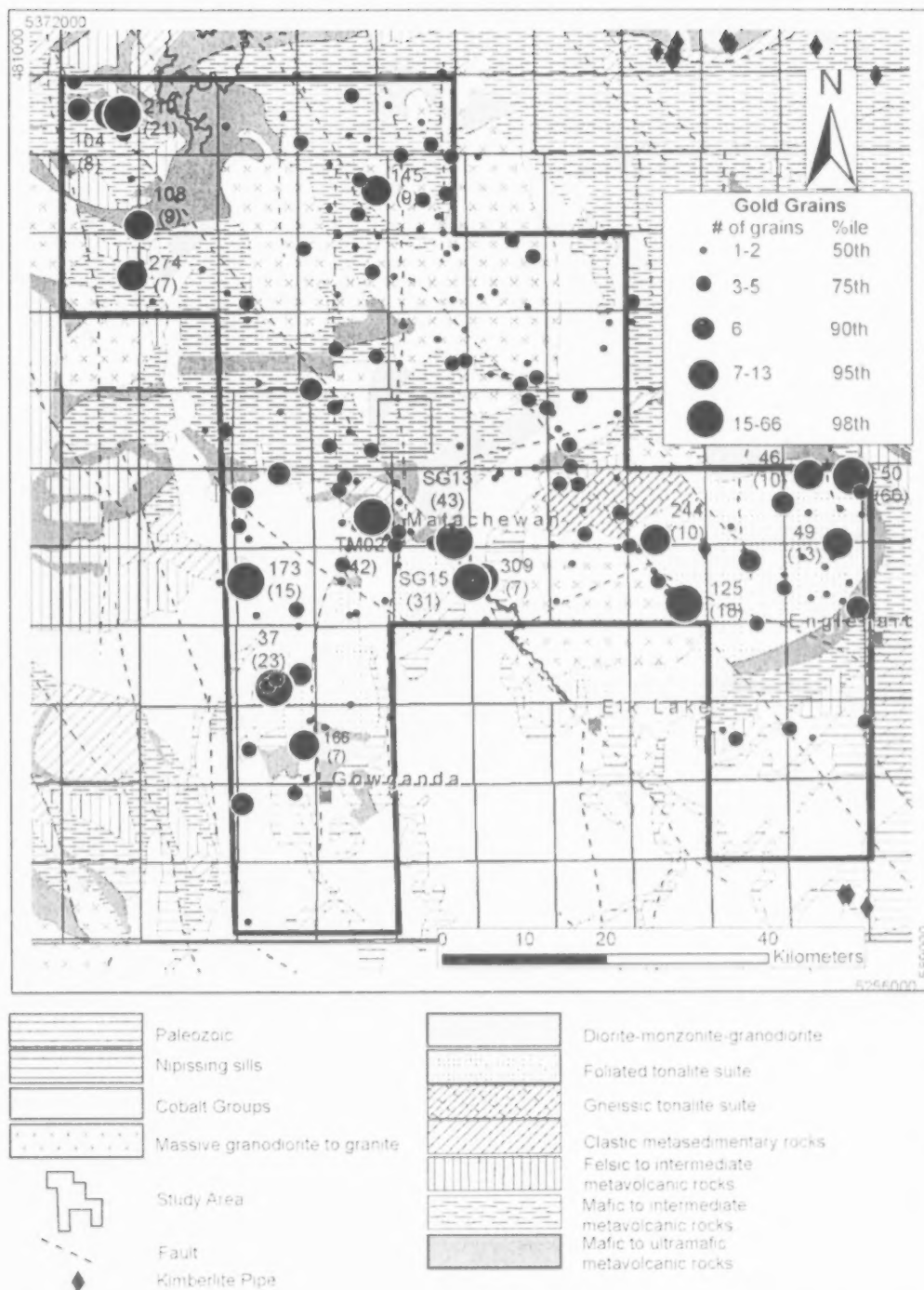


**Figure 36.** Regional distribution of gold grains. Anomalous sites are labelled by sample number with the corresponding number of grains shown in brackets.

# Conclusions

## KIMBERLITE AND RELATED ROCKS

The primary objective of this survey was to create a regional dataset on the types and distribution of kimberlite indicator minerals by means of modern alluvium sampling. This objective was successfully fulfilled and the results indicate that the potential for finding additional kimberlite bodies or related rock in the region is high for the following reasons: known kimberlites exist within the area; a number of important kimberlite indicator minerals were recovered; diamond potential indicators, such as G10 garnets and diamond inclusion chromites, were recovered often in association with other KIMs; and the presence of deep-seated structures present within the area combined with the Lake Timiskaming Structural Zone, which is believed to be associated with kimberlites already identified within the area. To locate the source(s) of the kimberlite indicator minerals, beyond the currently identified intrusions in the area, the sampling density needs to be increased and other exploration techniques, such as high-density till sampling and the rigorous use of geophysical data, employed. Therefore, more detailed exploration is recommended.

## BASE METALS AND GOLD

The anomalies outlined in this study may be representative of areas associated with quartz veins and feldspar porphyry dikes occupying shear zones or fractures within the metavolcanics or epizonal intrusions. They may also be associated with the Nipissing diabase, known gold-bearing structures or perhaps gold mineralization identified within the Round Lake Batholith. Further investigation of the identified anomalous sites may be warranted.

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Overburden Drilling Management performed the heavy mineral processing under contract to the OGS and Sandra Clarke and Dave Crabtree of the Geoscience Laboratories in Sudbury completed the microprobe work.

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**Appendix A**  
**SAMPLE SITE LOCATIONS**

# Appendix A. Sample Site Locations

| (UTM co-ordinates in<br>NAD83, Zone 17)<br>SAMPLE NUMBER | UTM     |          |
|----------------------------------------------------------|---------|----------|
|                                                          | EASTING | NORTHING |
| 03-JR-MA-001                                             | 538422  | 5333108  |
| 03-JR-MA-002                                             | 541946  | 5331094  |
| 03-JR-MA-003                                             | 543050  | 5329258  |
| 03-JR-MA-004                                             | 544316  | 5325524  |
| 03-JR-MA-005                                             | 544974  | 5324950  |
| 03-JR-MA-006                                             | 545742  | 5322954  |
| 03-JR-MA-007                                             | 548358  | 5326990  |
| 03-JR-MA-008                                             | 547061  | 5320946  |
| 03-JR-MA-009                                             | 547223  | 5318305  |
| 03-JR-MA-010                                             | 552901  | 5316868  |
| 03-JR-MA-011                                             | 552305  | 5313947  |
| 03-JR-MA-012                                             | 548142  | 5316078  |
| 03-JR-MA-013                                             | 552985  | 5308321  |
| 03-JR-MA-014                                             | 547374  | 5306334  |
| 03-JR-MA-015                                             | 545423  | 5301719  |
| 03-JR-MA-016                                             | 548891  | 5309963  |
| 03-JR-MA-017                                             | 548639  | 5312984  |
| 03-JR-MA-018                                             | 545873  | 5316161  |
| 03-JR-MA-019                                             | 538000  | 5316885  |
| 03-JR-MA-020                                             | 540788  | 5317609  |
| 03-JR-MA-021                                             | 531379  | 5312218  |
| 03-JR-MA-022                                             | 529229  | 5319579  |
| 03-JR-MA-023                                             | 529434  | 5317028  |
| 03-JR-MA-024                                             | 530212  | 5311830  |
| 03-JR-MA-025                                             | 534801  | 5309967  |
| 03-JR-MA-026                                             | 528492  | 5302037  |
| 03-JR-MA-027                                             | 524706  | 5309570  |
| 03-JR-MA-028                                             | 506733  | 5319423  |
| 03-JR-MA-029                                             | 520584  | 5297193  |
| 03-JR-MA-030                                             | 506587  | 5322004  |
| 03-JR-MA-031                                             | 520105  | 5292986  |
| 03-JR-MA-032                                             | 505322  | 5276574  |
| 03-JR-MA-033                                             | 522814  | 5291915  |
| 03-JR-MA-034                                             | 506928  | 5276949  |
| 03-JR-MA-035                                             | 514027  | 5292892  |
| 03-JR-MA-036                                             | 509931  | 5277552  |
| 03-JR-MA-037                                             | 510797  | 5291221  |
| 03-JR-MA-038                                             | 514737  | 5279987  |
| 03-JR-MA-039                                             | 510103  | 5291396  |
| 03-JR-MA-040                                             | 519260  | 5306289  |
| 03-JR-MA-041                                             | 511141  | 5292226  |
| 03-JR-MA-042                                             | 511126  | 5304497  |
| 03-JR-MA-043                                             | 508709  | 5300033  |
| 03-JR-MA-044                                             | 507482  | 5304128  |
| 03-JR-MA-045                                             | 511108  | 5299935  |
| 03-JR-MA-046                                             | 576422  | 5317267  |

|              | UTM     |          |
|--------------|---------|----------|
|              | EASTING | NORTHING |
| 03-JR-MA-047 | 507295  | 5303359  |
| 03-JR-MA-048 | 578381  | 5318026  |
| 03-JR-MA-049 | 579950  | 5308835  |
| 03-JR-MA-050 | 581656  | 5317098  |
| 03-JR-MA-051 | 579363  | 5307077  |
| 03-JR-MA-052 | 582836  | 5315110  |
| 03-JR-MA-053 | 575635  | 5307116  |
| 03-JR-MA-054 | 582927  | 5312295  |
| 03-JR-MA-055 | 578434  | 5305854  |
| 03-JR-MA-056 | 580300  | 5313043  |
| 03-JR-MA-057 | 581391  | 5303885  |
| 03-JR-MA-058 | 573249  | 5313850  |
| 03-JR-MA-059 | 582375  | 5300907  |
| 03-JR-MA-060 | 516220  | 5278344  |
| 03-JR-MA-061 | 580598  | 5301636  |
| 03-JR-MA-062 | 573383  | 5303277  |
| 03-JR-MA-063 | 578610  | 5302495  |
| 03-JR-MA-064 | 571818  | 5302487  |
| 03-JR-MA-065 | 576677  | 5302086  |
| 03-JR-MA-066 | 573504  | 5301856  |
| 03-JR-MA-067 | 577418  | 5297642  |
| 03-JR-MA-068 | 568576  | 5304377  |
| 03-JR-MA-069 | 577166  | 5292666  |
| 03-JR-MA-070 | 569168  | 5306681  |
| 03-JR-MA-071 | 575206  | 5291081  |
| 03-JR-MA-072 | 568551  | 5307817  |
| 03-JR-MA-073 | 580097  | 5293078  |
| 03-JR-MA-074 | 566870  | 5310824  |
| 03-JR-MA-075 | 581688  | 5286182  |
| 03-JR-MA-076 | 566273  | 5305511  |
| 03-JR-MA-077 | 579118  | 5279874  |
| 03-JR-MA-078 | 573426  | 5304923  |
| 03-JR-MA-079 | 558499  | 5326763  |
| 03-JR-MA-080 | 572052  | 5290107  |
| 03-JR-MA-081 | 575269  | 5278247  |
| 03-JR-MA-082 | 554681  | 5304096  |
| 03-JR-MA-083 | 574449  | 5276562  |
| 03-JR-MA-084 | 554170  | 5299318  |
| 03-JR-MA-085 | 554962  | 5327899  |
| 03-JR-MA-086 | 573689  | 5287720  |
| 03-JR-MA-087 | 573116  | 5274917  |
| 03-JR-MA-088 | 570831  | 5287259  |
| 03-JR-MA-089 | 569211  | 5274966  |
| 03-JR-MA-090 | 566967  | 5287010  |
| 03-JR-MA-091 | 570574  | 5274184  |
| 03-JR-MA-092 | 519106  | 5280696  |

# Appendix A. Sample Site Locations

| UTM co-ordinates in<br>NAD83, Zone 17)<br>SAMPLE NUMBER | UTM     |          |
|---------------------------------------------------------|---------|----------|
|                                                         | EASTING | NORTHING |
| 03-JR-MA-093                                            | 554834  | 5339916  |
| 03-JR-MA-094                                            | 520755  | 5277545  |
| 03-JR-MA-095                                            | 558148  | 5337340  |
| 03-JR-MA-096                                            | 531212  | 5350442  |
| 03-JR-MA-097                                            | 555852  | 5336433  |
| 03-JR-MA-098                                            | 488139  | 5363103  |
| 03-JR-MA-099                                            | 553791  | 5331262  |
| 03-JR-MA-100                                            | 533763  | 5349164  |
| 03-JR-MA-101                                            | 569058  | 5316745  |
| 03-JR-MA-102                                            | 529218  | 5351154  |
| 03-JR-MA-103                                            | 568700  | 5319995  |
| 03-JR-MA-104                                            | 490817  | 5361723  |
| 03-JR-MA-105                                            | 567694  | 5317410  |
| 03-JR-MA-106                                            | 492683  | 5359178  |
| 03-JR-MA-107                                            | 565166  | 5319077  |
| 03-JR-MA-108                                            | 494482  | 5348121  |
| 03-JR-MA-109                                            | 565337  | 5315020  |
| 03-JR-MA-110                                            | 487693  | 5351523  |
| 03-JR-MA-111                                            | 554335  | 5323165  |
| 03-JR-MA-112                                            | 536809  | 5354865  |
| 03-JR-MA-113                                            | 559150  | 5322499  |
| 03-JR-MA-114                                            | 514359  | 5358170  |
| 03-JR-MA-115                                            | 565785  | 5285807  |
| 03-JR-MA-116                                            | 537902  | 5303720  |
| 03-JR-MA-117                                            | 567396  | 5284746  |
| 03-JR-MA-118                                            | 537449  | 5305832  |
| 03-JR-MA-119                                            | 509562  | 5326294  |
| 03-JR-MA-120                                            | 544970  | 5308643  |
| 03-JR-MA-121                                            | 561040  | 5300403  |
| 03-JR-MA-122                                            | 552968  | 5324849  |
| 03-JR-MA-123                                            | 560305  | 5301544  |
| 03-JR-MA-124                                            | 541106  | 5328500  |
| 03-JR-MA-125                                            | 561009  | 5301414  |
| 03-JR-MA-126                                            | 547872  | 5300365  |
| 03-JR-MA-127                                            | 559698  | 5303018  |
| 03-JR-MA-128                                            | 504245  | 5304095  |
| 03-JR-MA-129                                            | 559028  | 5302785  |
| 03-JR-MA-130                                            | 520906  | 5300305  |
| 03-JR-MA-131                                            | 557888  | 5304168  |
| 03-JR-MA-132                                            | 518715  | 5339600  |
| 03-JR-MA-133                                            | 557351  | 5305407  |
| 03-JR-MA-134                                            | 518351  | 5336316  |
| 03-JR-MA-135                                            | 555472  | 5307940  |
| 03-JR-MA-136                                            | 517041  | 5338298  |
| 03-JR-MA-137                                            | 554393  | 5308538  |
| 03-JR-MA-138                                            | 518353  | 5325651  |

|              | UTM     |          |
|--------------|---------|----------|
|              | EASTING | NORTHING |
| 03-JR-MA-139 | 554152  | 5309525  |
| 03-JR-MA-140 | 518970  | 5326200  |
| 03-JR-MA-141 | 532764  | 5356430  |
| 03-JR-MA-142 | 520151  | 5322688  |
| 03-JR-MA-143 | 528815  | 5347557  |
| 03-JR-MA-144 | 522823  | 5320398  |
| 03-JR-MA-145 | 523462  | 5352367  |
| 03-JR-MA-146 | 530482  | 5325449  |
| 03-JR-MA-147 | 518894  | 5346888  |
| 03-JR-MA-148 | 512522  | 5335003  |
| 03-JR-MA-149 | 507030  | 5314686  |
| 03-JR-MA-150 | 514955  | 5333512  |
| 03-JR-MA-151 | 530429  | 5338917  |
| 03-JR-MA-152 | 523345  | 5334744  |
| 03-JR-MA-153 | 516850  | 5348429  |
| 03-JR-MA-154 | 523342  | 5335356  |
| 03-JR-MA-155 | 514059  | 5348599  |
| 03-JR-MA-156 | 521006  | 5327964  |
| 03-JR-MA-157 | 512290  | 5348398  |
| 03-JR-MA-158 | 515438  | 5309706  |
| 03-JR-MA-159 | 509978  | 5349959  |
| 03-JR-MA-160 | 515646  | 5309315  |
| 03-JR-MA-161 | 517453  | 5272745  |
| 03-JR-MA-162 | 513131  | 5309059  |
| 03-JR-MA-163 | 515053  | 5271501  |
| 03-JR-MA-164 | 524951  | 5283628  |
| 03-JR-MA-165 | 514261  | 5275769  |
| 03-JR-MA-166 | 514481  | 5284172  |
| 03-JR-MA-167 | 513378  | 5278218  |
| 03-JR-MA-168 | 546577  | 5347060  |
| 03-JR-MA-169 | 506600  | 5311050  |
| 03-JR-MA-170 | 546873  | 5345083  |
| 03-JR-MA-171 | 507825  | 5309470  |
| 03-JR-MA-172 | 519474  | 5266368  |
| 03-JR-MA-173 | 507400  | 5304300  |
| 03-JR-MA-174 | 526123  | 5310246  |
| 03-JR-MA-175 | 536802  | 5299470  |
| 03-JR-MA-176 | 526200  | 5313941  |
| 03-JR-MA-177 | 521501  | 5353646  |
| 03-JR-MA-178 | 524328  | 5317437  |
| 03-JR-MA-179 | 517765  | 5350174  |
| 03-JR-MA-180 | 525833  | 5316244  |
| 03-JR-MA-181 | 520909  | 5345349  |
| 03-JR-MA-182 | 519115  | 5304261  |
| 03-JR-MA-183 | 523699  | 5346666  |
| 03-JR-MA-184 | 518650  | 5304215  |

# Appendix A. Sample Site Locations

| UTM co-ordinates in<br>NAD83, Zone 17)<br>SAMPLE NUMBER | UTM     |          |
|---------------------------------------------------------|---------|----------|
|                                                         | EASTING | NORTHING |
| 03-JR-MA-185                                            | 527039  | 5345658  |
| 03-JR-MA-186                                            | 516442  | 5301106  |
| 03-JR-MA-187                                            | 528754  | 5342874  |
| 03-JR-MA-188                                            | 515986  | 5299173  |
| 03-JR-MA-189                                            | 533957  | 5341423  |
| 03-JR-MA-190                                            | 514001  | 5300806  |
| 03-JR-MA-191                                            | 534519  | 5339731  |
| 03-JR-MA-192                                            | 513626  | 5300775  |
| 03-JR-MA-193                                            | 533743  | 5342562  |
| 03-JR-MA-194                                            | 513893  | 5298720  |
| 03-JR-MA-195                                            | 536180  | 5341417  |
| 03-JR-MA-196                                            | 548169  | 5329333  |
| 03-JR-MA-197                                            | 536250  | 5339272  |
| 03-JR-MA-198                                            | 544031  | 5332763  |
| 03-JR-MA-199                                            | 532878  | 5338969  |
| 03-JR-MA-200                                            | 543903  | 5338000  |
| 03-JR-MA-201                                            | 530405  | 5340033  |
| 03-JR-MA-202                                            | 542032  | 5338047  |
| 03-JR-MA-203                                            | 531722  | 5340382  |
| 03-JR-MA-204                                            | 537998  | 5339849  |
| 03-JR-MA-205                                            | 512496  | 5359512  |
| 03-JR-MA-206                                            | 540136  | 5346190  |
| 03-JR-MA-207                                            | 536201  | 5331925  |
| 03-JR-MA-208                                            | 542688  | 5344168  |
| 03-JR-MA-209                                            | 540612  | 5319905  |
| 03-JR-MA-210                                            | 492474  | 5361685  |
| 03-JR-MA-211                                            | 542846  | 5318159  |
| 03-JR-MA-212                                            | 529087  | 5360610  |
| 03-JR-MA-213                                            | 538829  | 5318005  |
| 03-JR-MA-214                                            | 531609  | 5366806  |
| 03-JR-MA-215                                            | 538544  | 5317499  |
| 03-JR-MA-216                                            | 529333  | 5363977  |
| 03-JR-MA-217                                            | 535019  | 5317269  |
| 03-JR-MA-218                                            | 523013  | 5342281  |
| 03-JR-MA-219                                            | 532680  | 5321389  |
| 03-JR-MA-220                                            | 518847  | 5315472  |
| 03-JR-MA-221                                            | 533703  | 5320874  |
| 03-JR-MA-222                                            | 519774  | 5314069  |
| 03-JR-MA-223                                            | 536612  | 5322888  |
| 03-JR-MA-224                                            | 518959  | 5313434  |
| 03-JR-MA-225                                            | 542094  | 5326526  |
| 03-JR-MA-226                                            | 519213  | 5311421  |
| 03-JR-MA-227                                            | 539150  | 5329600  |
| 03-JR-MA-228                                            | 518901  | 5309590  |
| 03-JR-MA-229                                            | 549350  | 5323250  |
| 03-JR-MA-230                                            | 519969  | 5308260  |

|              | UTM     |          |
|--------------|---------|----------|
|              | EASTING | NORTHING |
| 03-JR-MA-231 | 549093  | 5322910  |
| 03-JR-MA-232 | 518118  | 5306525  |
| 03-JR-MA-233 | 548630  | 5322800  |
| 03-JR-MA-234 | 570296  | 5271179  |
| 03-JR-MA-235 | 504302  | 5328849  |
| 03-JR-MA-236 | 577684  | 5276626  |
| 03-JR-MA-237 | 504284  | 5325504  |
| 03-JR-MA-238 | 581918  | 5281706  |
| 03-JR-MA-239 | 504784  | 5323141  |
| 03-JR-MA-240 | 583298  | 5286800  |
| 03-JR-MA-241 | 502560  | 5322856  |
| 03-JR-MA-242 | 556702  | 5309774  |
| 03-JR-MA-243 | 504964  | 5322781  |
| 03-JR-MA-244 | 557490  | 5309314  |
| 03-JR-MA-245 | 520806  | 5310851  |
| 03-JR-MA-246 | 554404  | 5311379  |
| 03-JR-MA-247 | 530935  | 5334046  |
| 03-JR-MA-248 | 553171  | 5312592  |
| 03-JR-MA-249 | 526720  | 5335805  |
| 03-JR-MA-250 | 551088  | 5312122  |
| 03-JR-MA-251 | 551278  | 5332872  |
| 03-JR-MA-252 | 525652  | 5341751  |
| 03-JR-MA-253 | 551987  | 5336091  |
| 03-JR-MA-254 | 527050  | 5338391  |
| 03-JR-MA-255 | 547573  | 5340753  |
| 03-JR-MA-256 | 529080  | 5332835  |
| 03-JR-MA-257 | 551399  | 5346494  |
| 03-JR-MA-258 | 534325  | 5331395  |
| 03-JR-MA-259 | 526563  | 5356565  |
| 03-JR-MA-260 | 532766  | 5331042  |
| 03-JR-MA-261 | 524433  | 5352888  |
| 03-JR-MA-262 | 529648  | 5329581  |
| 03-JR-MA-263 | 522403  | 5358691  |
| 03-JR-MA-264 | 526238  | 5331097  |
| 03-JR-MA-265 | 520178  | 5359005  |
| 03-JR-MA-266 | 518961  | 5342526  |
| 03-JR-MA-267 | 520558  | 5363866  |
| 03-JR-MA-268 | 514594  | 5345125  |
| 03-JR-MA-269 | 537467  | 5329736  |
| 03-JR-MA-270 | 502289  | 5342595  |
| 03-JR-MA-271 | 530233  | 5357913  |
| 03-JR-MA-272 | 496180  | 5338719  |
| 03-JR-MA-273 | 523469  | 5331934  |
| 03-JR-MA-274 | 493646  | 5341899  |
| 03-JR-MA-275 | 521731  | 5334370  |
| 03-JR-MA-276 | 492312  | 5339011  |



# Appendix A. Sample Site Locations

| UTM co-ordinates in<br>NAD83, Zone 17)<br>SAMPLE NUMBER | UTM     |          |
|---------------------------------------------------------|---------|----------|
|                                                         | EASTING | NORTHING |
| 03-JR-MA-277                                            | 520379  | 5337548  |
| 03-JR-MA-278                                            | 488110  | 5340067  |
| 03-JR-MA-279                                            | 518522  | 5332834  |
| 03-JR-MA-280                                            | 493618  | 5353767  |
| 03-JR-MA-281                                            | 515402  | 5327954  |
| 03-JR-MA-282                                            | 485665  | 5345721  |
| 03-JR-MA-283                                            | 511733  | 5325109  |
| 03-JR-MA-284                                            | 494747  | 5343390  |
| 03-JR-MA-285                                            | 509118  | 5328680  |
| 03-JR-MA-286                                            | 524467  | 5301829  |
| 03-JR-MA-287                                            | 507730  | 5336482  |
| 03-JR-MA-288                                            | 525653  | 5308626  |
| 03-JR-MA-289                                            | 510242  | 5335660  |
| 03-JR-MA-290                                            | 526037  | 5306245  |
| 03-JR-MA-291                                            | 507659  | 5338573  |
| 03-JR-MA-292                                            | 530456  | 5308916  |
| 03-JR-MA-293                                            | 505299  | 5339789  |
| 03-JR-MA-294                                            | 532528  | 5307552  |
| 03-JR-MA-295                                            | 513907  | 5320482  |
| 03-JR-MA-296                                            | 533877  | 5307647  |
| 03-JR-MA-297                                            | 525020  | 5362729  |
| 03-JR-MA-298                                            | 534350  | 5305048  |
| 03-JR-MA-299                                            | 507621  | 5262314  |
| 03-JR-MA-300                                            | 517717  | 5320899  |
| 03-JR-MA-301                                            | 507764  | 5283574  |
| 03-JR-MA-302                                            | 487125  | 5362237  |
| 03-JR-MA-303                                            | 494026  | 5338017  |
| 03-JR-MA-304                                            | 495099  | 5340001  |
| 03-JR-MA-305                                            | 505182  | 5360133  |
| 03-JR-MA-306                                            | 506256  | 5358966  |
| 03-JR-MA-307                                            | 512195  | 5361447  |
| 03-JR-MA-308                                            | 519567  | 5316959  |
| 03-JR-MA-309                                            | 536468  | 5304590  |
| 03-JR-MA-310                                            | 520855  | 5289566  |
| 03-JR-MA-311                                            | 489717  | 5360665  |
| 03-JR-MA-312                                            | 517435  | 5346825  |
| 03-JR-MA-313                                            | 518399  | 5287109  |
| 03-JR-MA-314                                            | 517039  | 5286356  |
| 03-JR-MA-315                                            | 515211  | 5287117  |
| 03-JR-MA-316                                            | 514364  | 5282708  |
| 03-JR-MA-317                                            | 520185  | 5289073  |
| 03-JR-BD-001                                            | 536016  | 5356453  |
| 03-JR-BD-002                                            | 532886  | 5350714  |
| 03-JR-BD-003                                            | 531046  | 5349109  |
| 03-JR-BD-004                                            | 533278  | 5345281  |
| 03-JR-BD-005                                            | 531730  | 5347052  |

|              | UTM     |          |
|--------------|---------|----------|
|              | EASTING | NORTHING |
| 03-JR-BD-006 | 532200  | 5344544  |
| 03-JR-BD-007 | 534324  | 5335204  |
| 03-JR-BD-008 | 513708  | 5366556  |
| 03-JR-BD-009 | 514655  | 5364340  |
| 03-JR-BD-010 | 518438  | 5352312  |
| 03-JR-BD-011 | 512355  | 5303671  |
| 03-JR-BD-012 | 518916  | 5345102  |
| 03-JR-SG-001 | 570025  | 5298953  |
| 03-JR-SG-002 | 569127  | 5306653  |
| 03-JR-SG-003 | 579888  | 5277146  |
| 03-JR-SG-004 | 567291  | 5292145  |
| 03-JR-SG-005 | 572429  | 5278382  |
| 03-JR-SG-006 | 554730  | 5336160  |
| 03-JR-SG-007 | 554829  | 5338634  |
| 03-JR-SG-008 | 573987  | 5286014  |
| 03-JR-SG-009 | 560475  | 5322341  |
| 03-JR-SG-010 | 511505  | 5317566  |
| 03-JR-SG-011 | 517771  | 5355554  |
| 03-JR-SG-012 | 572764  | 5315346  |
| 03-JR-SG-013 | 532932  | 5309213  |
| 03-JR-SG-014 | 505871  | 5276930  |
| 03-JR-SG-015 | 534928  | 5304128  |
| 03-JR-SG-016 | 509729  | 5276150  |
| 03-JR-SG-017 | 532107  | 5351899  |
| 03-JR-SG-018 | 516474  | 5278543  |
| 03-JR-SG-019 | 521255  | 5349378  |
| 03-JR-SG-020 | 486589  | 5365574  |
| 03-JR-SG-021 | 576393  | 5312554  |
| 03-JR-SG-022 | 576857  | 5284877  |
| 03-JR-TM-001 | 509149  | 5317619  |
| 03-JR-TM-002 | 522869  | 5312174  |
| 03-JR-TM-003 | 520990  | 5316532  |
| 03-JR-TM-004 | 519215  | 5278747  |
| 03-JR-TM-005 | 520128  | 5300112  |
| 03-JR-TM-006 | 527615  | 5310291  |

## Appendix C

### SUMMARY OF KIMBERLITE INDICATOR MINERAL COUNTS

#### Summary List of Abbreviations

|      |                                            |
|------|--------------------------------------------|
| KIM  | Kimberlite Indicator Minerals              |
| Diop | Diopside                                   |
| GP   | Pyrope Garnet                              |
| GO   | Eclogitic Garnet                           |
| DC   | Chrome Diopside                            |
| IM   | Ilmenite                                   |
| CR   | Chromite                                   |
| FO   | Forsteritic Olivine                        |
| (p)  | Amount of grains picked from the sample    |
| (e)  | Amount of grains estimated to be in sample |

# Appendix C. KIM Counts

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |                     | KIM Count     |    |    |    |               |    |    |    |                |    |        |        |    |      | Total<br>KIMs |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------|----|----|----|---------------|----|----|----|----------------|----|--------|--------|----|------|---------------|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |                     | 1.0 to 2.0 mm |    |    |    | 0.5 to 1.0 mm |    |    |    | 0.25 to 0.5 mm |    |        |        |    |      |               |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP            | GO | DC | IM | CR            | FO | GP | GO | DC             | IM | CR (p) | CR (e) | FO |      |               |
| 03-JR-MA-001     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 0      | 0  | 0    |               |
| 03-JR-MA-002     | No Sample            | 0                   | 0                   | 1                   | 0                   | No Sample           |               |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 0      | 0  | 0    |               |
| 03-JR-MA-003     | 0                    | 1                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 0      | 0  | 0    |               |
| 03-JR-MA-004     | No Sample            | 0                   | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 1      | 0  | 0    | 1             |
| 03-JR-MA-005     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | No Sample     |    |    |    | 0              | 0  | 0      | 0      | 0  | 0    | 0             |
| 03-JR-MA-006     | 0                    | 0                   | 0                   | 23                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 1             | 0  | 2  | 1  | 2              | 0  | 115    | 500    | 0  | 508  |               |
| 03-JR-MA-007     | No Sample            | 0                   | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 1      | 0  | 0    | 1             |
| 03-JR-MA-008     | No Sample            | 0                   | 0                   | 3                   | 0                   | No Sample           |               |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 1      | 0  | 0    | 1             |
| 03-JR-MA-009     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | No Sample     |    |    |    | 0              | 0  | 0      | 0      | 0  | 0    | 0             |
| 03-JR-MA-010     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 6      | 0      | 0  | 6    |               |
| 03-JR-MA-011     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | No Sample     |    |    |    | 0              | 0  | 0      | 0      | 0  | 0    | 0             |
| 03-JR-MA-012     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | No Sample     |    |    |    | 0              | 0  | 0      | 0      | 0  | 0    | 0             |
| 03-JR-MA-013     | No Sample            | 0                   | 0                   | 3                   | 0                   | No Sample           |               |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 1      | 0  | 0    | 1             |
| 03-JR-MA-014     | 0                    | 0                   | 0                   | 12                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 7      | 0      | 0  | 7    |               |
| 03-JR-MA-015     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 22     | 0      | 0  | 22   |               |
| 03-JR-MA-016     | 0                    | 0                   | 0                   | 8                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 11     | 0      | 0  | 11   |               |
| 03-JR-MA-017     | No Sample            | 0                   | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0      | 0      | 0  | 0    | 0             |
| 03-JR-MA-018     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 2      | 0      | 0  | 2    |               |
| 03-JR-MA-019     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample           |               |    |    |    | No Sample     |    |    |    | 0              | 0  | 0      | 1      | 0  | 0    | 1             |
| 03-JR-MA-020     | No Sample            | No Sample           | 3                   | 0                   | 0                   | No Sample           |               |    |    |    | No Sample     |    |    |    | 0              | 1  | 0      | 2      | 0  | 0    | 3             |
| 03-JR-MA-021     | 0                    | 1                   | 0                   | 8                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 22     | 0      | 0  | 22   |               |
| 03-JR-MA-022     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 1             | 0  | 0  | 0  | 1              | 0  | 65     | 100    | 0  | 102  |               |
| 03-JR-MA-023     | 0                    | 2                   | 0                   | 5                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 1  | 0      | 2      | 0  | 3    |               |
| 03-JR-MA-024     | 0                    | 0                   | 0                   | 5                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 5             | 0  | 1  | 0  | 0              | 0  | 80     | 800    | 0  | 806  |               |
| 03-JR-MA-025     | 0                    | 2                   | 0                   | 17                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 1             | 3  | 0  | 0  | 0              | 0  | 80     | 5000   | 0  | 5004 |               |
| 03-JR-MA-026     | 0                    | 0                   | 0                   | 5                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 1  | 0      | 2      | 0  | 3    |               |
| 03-JR-MA-027     | 0                    | 0                   | 0                   | 11                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 1  | 0      | 13     | 0  | 14   |               |
| 03-JR-MA-028     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 45     | 70     | 0  | 70   |               |
| 03-JR-MA-029     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0              | 0  | 85     | 200    | 0  | 201  |               |
| 03-JR-MA-030     | 0                    | 0                   | 0                   | 2                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 19     | 0      | 0  | 19   |               |

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |                     | KIM Count     |    |    |    |    |    |               |    |    |    |    |    |                |    |    |    |        |        | Total<br>KIMS |     |   |   |   |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------|----|----|----|----|----|---------------|----|----|----|----|----|----------------|----|----|----|--------|--------|---------------|-----|---|---|---|
|                  | 1.0-2.0 mm           |                     |                     | 0.25- 0.5 mm        |                     |                     | 1.0 to 2.0 mm |    |    |    |    |    | 0.5 to 1.0 mm |    |    |    |    |    | 0.25 to 0.5 mm |    |    |    |        |        |               |     |   |   |   |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP            | GO | DC | IM | CR | FO | GP            | GO | DC | IM | CR | FO | GP             | GO | DC | IM | CR (p) | CR (e) |               | FO  |   |   |   |
| 03-JR-MA-001     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   |   |   |   |
| 03-JR-MA-002     | No Sample            | 0                   | 0                   | 1                   | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   | 0 |   |   |
| 03-JR-MA-003     | 0                    | 1                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   |   |   |   |
| 03-JR-MA-004     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 1      | 0             | 0   | 1 |   |   |
| 03-JR-MA-005     | No Sample            | No Sample           |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    |    | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   | 0 | 0 | 0 |
| 03-JR-MA-006     | 0                    | 0                   | 0                   | 23                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 1             | 1  | 0  | 0  | 1  | 0  | 2              | 1  | 2  | 0  | 115    | 500    | 0             | 508 |   |   |   |
| 03-JR-MA-007     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 1      | 0             | 0   | 1 |   |   |
| 03-JR-MA-008     | No Sample            | 0                   | 0                   | 3                   | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 1      | 0             | 0   | 1 |   |   |
| 03-JR-MA-009     | No Sample            | No Sample           |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    |    | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   | 0 | 0 | 0 |
| 03-JR-MA-010     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 6      | 0      | 0             | 6   |   |   |   |
| 03-JR-MA-011     | No Sample            | No Sample           |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    |    | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   | 0 | 0 | 0 |
| 03-JR-MA-012     | No Sample            | No Sample           |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    |    | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   | 0 | 0 | 0 |
| 03-JR-MA-013     | No Sample            | 0                   | 0                   | 3                   | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 1      | 0             | 0   | 1 |   |   |
| 03-JR-MA-014     | 0                    | 0                   | 0                   | 12                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 7      | 0      | 0             | 7   |   |   |   |
| 03-JR-MA-015     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 22 | 0      | 0      | 22            |     |   |   |   |
| 03-JR-MA-016     | 0                    | 0                   | 0                   | 8                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 11 | 0      | 0      | 11            |     |   |   |   |
| 03-JR-MA-017     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0      | 0      | 0             | 0   | 0 |   |   |
| 03-JR-MA-018     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 2  | 0      | 0      | 2             |     |   |   |   |
| 03-JR-MA-019     | No Sample            | No Sample           |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    |    | 0              | 0  | 0  | 0  | 1      | 0      | 0             | 0   | 0 | 1 |   |
| 03-JR-MA-020     | No Sample            | No Sample           |                     |                     | 3                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    |    | 0              | 1  | 0  | 0  | 2      | 0      | 0             | 0   | 3 |   |   |
| 03-JR-MA-021     | 0                    | 1                   | 0                   | 8                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 22 | 0      | 0      | 22            |     |   |   |   |
| 03-JR-MA-022     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 1             | 0  | 0  | 0  | 1  | 0  | 0              | 0  | 1  | 65 | 100    | 0      | 102           |     |   |   |   |
| 03-JR-MA-023     | 0                    | 2                   | 0                   | 5                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 2      | 0      | 3             |     |   |   |   |
| 03-JR-MA-024     | 0                    | 0                   | 0                   | 5                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 5  | 0             | 1  | 0  | 0  | 0  | 0  | 0              | 1  | 0  | 80 | 800    | 0      | 806           |     |   |   |   |
| 03-JR-MA-025     | 0                    | 2                   | 0                   | 17                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 1  | 3             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 80 | 5000   | 0      | 5004          |     |   |   |   |
| 03-JR-MA-026     | 0                    | 0                   | 0                   | 5                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 2      | 0      | 3             |     |   |   |   |
| 03-JR-MA-027     | 0                    | 0                   | 0                   | 11                  | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 13     | 0      | 14            |     |   |   |   |
| 03-JR-MA-028     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 45 | 70     | 0      | 70            |     |   |   |   |
| 03-JR-MA-029     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 1  | 0  | 85 | 200    | 0      | 201           |     |   |   |   |
| 03-JR-MA-030     | 0                    | 0                   | 0                   | 2                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 19 | 0      | 0      | 19            |     |   |   |   |

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |    | KIM Count     |    |    |    |               |    |    |    |                |    |    |    |    |    | Total<br>KIMS |    |        |        |    |     |    |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|----|---------------|----|----|----|---------------|----|----|----|----------------|----|----|----|----|----|---------------|----|--------|--------|----|-----|----|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |    | 1.0 to 2.0 mm |    |    |    | 0.5 to 1.0 mm |    |    |    | 0.25 to 0.5 mm |    |    |    |    |    |               |    |        |        |    |     |    |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | GP | GO            | DC | IM | CR | FO            | GP | GO | DC | IM             | CR | FO | GP | GO | DC |               | IM | CR (p) | CR (e) | FO |     |    |
| 03-JR-MA-031     | 0                    | 0                   | 0                   | 1                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 5  | 0  | 0  | 0             | 0  | 30     | 60     | 0  | 65  |    |
| 03-JR-MA-032     | 0                    | 0                   | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  |     |    |
| 03-JR-MA-033     | 0                    | 0                   | 0                   | 5                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 80     | 120    | 0  | 120 |    |
| 03-JR-MA-034     | No Sample            | 0                   | 0                   | 3                   | 0                   | 0  | No Sample     |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-035     | No Sample            | No Sample           |                     | 0                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-036     | 0                    | 0                   | 0                   | 14                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 1  | 3      | 0      | 0  | 4   |    |
| 03-JR-MA-037     | No Sample            | 0                   | 0                   | 1                   | 0                   | 0  | No Sample     |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 1      | 0      | 0  | 1   |    |
| 03-JR-MA-038     | 0                    | 1                   | 0                   | 5                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 16 | 0      | 0      | 0  | 17  |    |
| 03-JR-MA-039     | No Sample            | No Sample           |                     | 0                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-040     | 0                    | 0                   | 0                   | 1                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 3  | 0      | 0      | 0  | 3   |    |
| 03-JR-MA-041     | 0                    | 0                   | 0                   | 3                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0              | 0  | 0  | 1  | 0  | 0  | 0             | 60 | 100    | 0      | 0  | 101 |    |
| 03-JR-MA-042     | 0                    | 2                   | 0                   | 26                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 25 | 50     | 0      | 0  | 50  |    |
| 03-JR-MA-043     | 0                    | 0                   | 0                   | 12                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 3  | 0  | 0  | 0  | 0             | 90 | 300    | 0      | 0  | 303 |    |
| 03-JR-MA-044     | 0                    | 0                   | 0                   | 6                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 61 | 100    | 0      | 0  | 100 |    |
| 03-JR-MA-045     | 0                    | 0                   | 0                   | 10                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 1  | 0             | 5  | 0      | 0      | 0  | 6   |    |
| 03-JR-MA-046     | No Sample            | 0                   | 0                   | 1                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-047     | 0                    | 0                   | 0                   | 3                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 20 | 50     | 0      | 0  | 50  |    |
| 03-JR-MA-048     | 0                    | 0                   | 0                   | 10                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 1  | 0  | 0  | 0              | 0  | 3  | 1  | 2  | 1  | 9             | 0  | 0      | 0      | 0  | 17  |    |
| 03-JR-MA-049     | 0                    | 0                   | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-050     | 0                    | 0                   | 0                   | 5                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0              | 0  | 4  | 0  | 2  | 0  | 2             | 0  | 0      | 0      | 0  | 9   |    |
| 03-JR-MA-051     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-052     | 0                    | 0                   | 0                   | 26                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 1  | 0  | 0  | 0  | 12 | 4             | 5  | 1      | 7      | 0  | 0   | 30 |
| 03-JR-MA-053     | No Sample            | No Sample           |                     | 0                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | No Sample      |    |    |    | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   | 0  |
| 03-JR-MA-054     | 0                    | 1                   | 0                   | 11                  | 0                   | 0  | 1             | 1  | 0  | 0  | 0             | 0  | 1  | 3  | 2              | 0  | 0  | 0  | 0  | 11 | 2             | 4  | 1      | 17     | 0  | 0   | 43 |
| 03-JR-MA-055     | 0                    | 0                   | 0                   | 6                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 2  | 0  | 0             | 0  | 8      | 0      | 0  | 11  |    |
| 03-JR-MA-056     | 0                    | 0                   | 0                   | 3                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 1  | 2  | 0             | 0  | 0      | 0      | 0  | 3   |    |
| 03-JR-MA-057     | 0                    | 0                   | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   |    |
| 03-JR-MA-058     | 0                    | 0                   | 0                   | 3                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 1  | 0  | 0  | 0              | 0  | 0  | 0  | 3  | 1  | 1             | 0  | 17     | 0      | 0  | 23  |    |
| 03-JR-MA-059     | No Sample            | 0                   | 0                   | 1                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0  | 0   | 1  |
| 03-JR-MA-060     | 0                    | 0                   | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 0  | 0  | 0             | 40 | 0      | 0      | 0  | 41  |    |



# Appendix C. KIM Counts

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |                     | KIM Count     |           |           |           |               |           |           |           |                |           |           |           |           |           | Total<br>KIMS |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------|-----------|-----------|-----------|---------------|-----------|-----------|-----------|----------------|-----------|-----------|-----------|-----------|-----------|---------------|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |                     | 1.0 to 2.0 mm |           |           |           | 0.5 to 1.0 mm |           |           |           | 0.25 to 0.5 mm |           |           |           |           |           |               |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP            | GO        | DC        | IM        | CR            | FO        | GP        | GO        | DC             | IM        | CR        | (p)       | CR        | (e)       |               |
| 03-JR-MA-061     | 0                    | 0                   | 0                   | 6                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 2         | 3         | 0         | 0         | 5             |
| 03-JR-MA-062     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-063     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 1         | 0         | 61        | 0         | 62            |
| 03-JR-MA-064     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-065     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-066     | 0                    | 1                   | 0                   | 5                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 3         | 1         | 0         | 1              | 0         | 1         | 0         | 1         | 0         | 3             |
| 03-JR-MA-067     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-068     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-069     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 1         | 0         | 1             |
| 03-JR-MA-070     | 0                    | 1                   | 0                   | 2                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 7         | 0         | 2         | 10            |
| 03-JR-MA-071     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-072     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-073     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-074     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-075     | 0                    | 0                   | 0                   | 6                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 1         | 0              | 0         | 0         | 11        | 0         | 1         | 14            |
| 03-JR-MA-076     | 0                    | 1                   | 0                   | 6                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 1         | 0         | 0              | 0         | 1         | 7         | 0         | 1         | 13            |
| 03-JR-MA-077     | 0                    | 0                   | 0                   | 7                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 1         | 0              | 0         | 0         | 9         | 0         | 0         | 10            |
| 03-JR-MA-078     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 5         | 0         | 0         | 5             |
| 03-JR-MA-079     | 0                    | 0                   | 0                   | 6                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 5         | 0         | 0         | 5             |
| 03-JR-MA-080     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-081     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 2         | 0              | 0         | 0         | 25        | 50        | 1         | 53            |
| 03-JR-MA-082     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-083     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-084     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 1         | 0         | 0              | 0         | 7         | 0         | 0         | 0         | 8             |
| 03-JR-MA-085     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-086     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-087     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | No Sample | No Sample | 0             |
| 03-JR-MA-088     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-089     | 0                    | 1                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0         | 0         | 0             |
| 03-JR-MA-090     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 6         | 0         | 0         | 0         | 6             |



## Appendix C. KIM Counts

[illegible]

Appendix C. KIM Counts

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |                     | KIM Count     |    |    |           |               |    |    |           |                |    |    |     |      |     | Total<br>KIMs |     |      |        |        |    |   |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------|----|----|-----------|---------------|----|----|-----------|----------------|----|----|-----|------|-----|---------------|-----|------|--------|--------|----|---|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25- 0.5 mm        |                     | 1.0 to 2.0 mm |    |    |           | 0.5 to 1.0 mm |    |    |           | 0.25 to 0.5 mm |    |    |     |      |     |               |     |      |        |        |    |   |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP            | GO | DC | IM        | CR            | FO | GP | GO        | DC             | IM | CR | FO  | GP   | GO  |               | DC  | IM   | CR (p) | CR (e) | FO |   |
| 03-JR-MA-121     | No Sample            | 0                   | 0                   | 2                   | 0                   | 0                   | No Sample     |    |    |           | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  |   |
| 03-JR-MA-122     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 2   | 0    | 0   | 0             | 0   | 19   | 0      | 0      | 21 |   |
| 03-JR-MA-123     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 13   | 0      | 0      | 13 |   |
| 03-JR-MA-124     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     |    |    |           | 0             | 0  | 0  | 0         | 0              | 1  | 0  | 0   | 0    | 0   | 1             | 0   | 0    | 0      | 0      | 1  |   |
| 03-JR-MA-125     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     |    |    |           | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  |   |
| 03-JR-MA-126     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 16   | 0      | 0      | 16 |   |
| 03-JR-MA-127     | No Sample            | No Sample           |                     | 1                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  |   |
| 03-JR-MA-128     | 0                    | 1                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 3  | 0  | 0         | 1              | 0  | 0  | 1   | 0    | 50  | 250           | 0   | 255  | 0      | 255    | 0  |   |
| 03-JR-MA-129     | No Sample            | 0                   | 0                   | 0                   | 0                   | No Sample           |               |    |    | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  |   |
| 03-JR-MA-130     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 15  | 0    | 0      | 15     |    |   |
| 03-JR-MA-131     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 12  | 0    | 0      | 12     |    |   |
| 03-JR-MA-132     | No Sample            | No Sample           |                     | 0                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | No Sample |                |    |    | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  | 0 |
| 03-JR-MA-133     | No Sample            | No Sample           |                     | 1                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | No Sample |                |    |    | 0   | 0    | 0   | 0             | 1   | 0    | 0      | 0      | 1  |   |
| 03-JR-MA-134     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 2  | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 110 | 300           | 0   | 302  | 0      | 302    | 0  |   |
| 03-JR-MA-135     | No Sample            | No Sample           |                     | 2                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | No Sample |                |    |    | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  | 0 |
| 03-JR-MA-136     | No Sample            | 0                   | 0                   | 2                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 0             | 0   | 0    | 0      | 0      | 0  |   |
| 03-JR-MA-137     | No Sample            | 0                   | 0                   | 4                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 12            | 0   | 0    | 0      | 0      | 12 |   |
| 03-JR-MA-138     | 0                    | 0                   | 0                   | 9                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 16 | 0  | 0         | 0              | 0  | 0  | 0   | 0    | 150 | 7000          | 1   | 7017 | 0      | 7017   | 0  |   |
| 03-JR-MA-139     | No Sample            | 0                   | 0                   | 4                   | 0                   | No Sample           |               |    |    | No Sample |               |    |    | 0         | 0              | 0  | 0  | 0   | 0    | 0   | 4             | 0   | 0    | 0      | 0      | 4  |   |
| 03-JR-MA-140     | 0                    | 0                   | 0                   | 7                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 1             | 0  | 0  | 0         | 0              | 0  | 0  | 0   | 60   | 400 | 0             | 401 | 0    | 401    | 0      |    |   |
| 03-JR-MA-141     | No Sample            | 0                   | 0                   | 12                  | 0                   | No Sample           |               |    |    | No Sample |               |    |    | 0         | 0              | 0  | 0  | 0   | 0    | 1   | 0             | 0   | 1    | 0      | 0      | 1  |   |
| 03-JR-MA-142     | 0                    | 0                   | 0                   | 7                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 1         | 0              | 0  | 0  | 31  | 50   | 0   | 51            | 0   | 51   | 0      | 51     |    |   |
| 03-JR-MA-143     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 7   | 0    | 0   | 0             | 7   | 0    | 0      | 7      |    |   |
| 03-JR-MA-144     | 0                    | 0                   | 0                   | 10                  | 0                   | 0                   | 0             | 0  | 0  | 0         | 2             | 0  | 0  | 0         | 0              | 0  | 0  | 105 | 2000 | 0   | 2002          | 0   | 2002 | 0      | 2002   | 0  |   |
| 03-JR-MA-145     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 1             | 0  | 0  | 0         | 0              | 0  | 0  | 46  | 70   | 0   | 71            | 0   | 71   | 0      | 71     |    |   |
| 03-JR-MA-146     | 0                    | 0                   | 0                   | 16                  | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 9   | 0    | 0   | 0             | 9   | 0    | 0      | 9      |    |   |
| 03-JR-MA-147     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 1             | 0  | 0  | 0         | 1              | 0  | 0  | 9   | 0    | 2   | 13            | 0   | 13   | 0      | 13     |    |   |
| 03-JR-MA-148     | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 5             | 0  | 0  | 0         | 0              | 0  | 0  | 25  | 60   | 0   | 66            | 0   | 66   | 0      | 66     |    |   |
| 03-JR-MA-149     | 0                    | 0                   | 0                   | 11                  | 0                   | 0                   | 0             | 0  | 0  | 0         | 1             | 0  | 0  | 0         | 0              | 0  | 0  | 50  | 500  | 0   | 501           | 0   | 501  | 0      | 501    |    |   |
| 03-JR-MA-150     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0             | 0  | 0  | 0         | 0             | 0  | 0  | 0         | 0              | 0  | 0  | 18  | 0    | 0   | 18            | 0   | 18   | 0      | 18     |    |   |

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |  |                     |  |                     |    | KIM Count     |           |    |    |    |    |               |           |    |    |    |    |                |    | Total<br>KIMs |    |    |        |        |      |     |    |   |   |   |
|------------------|----------------------|--|---------------------|--|---------------------|----|---------------|-----------|----|----|----|----|---------------|-----------|----|----|----|----|----------------|----|---------------|----|----|--------|--------|------|-----|----|---|---|---|
|                  | 1.0-2.0 mm           |  | 0.5-1.0 mm          |  | 0.25-0.5 mm         |    | 1.0 to 2.0 mm |           |    |    |    |    | 0.5 to 1.0 mm |           |    |    |    |    | 0.25 to 0.5 mm |    |               |    |    |        |        |      |     |    |   |   |   |
|                  | Low-Cr<br>Diop.      |  | Low-Cr<br>Diop. (p) |  | Low-Cr<br>Diop. (e) |    | GP            | GO        | DC | IM | CR | FO | GP            | GO        | DC | IM | CR | FO | GP             | GO |               | DC | IM | CR (p) | CR (e) | FO   |     |    |   |   |   |
| 03-JR-MA-151     | 0                    |  | 0                   |  | 0                   | 18 | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 1             | 0  | 0  | 27     | 70     | 0    | 71  |    |   |   |   |
| 03-JR-MA-152     | 0                    |  | 0                   |  | 0                   | 1  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 7      | 0      | 0    | 7   |    |   |   |   |
| 03-JR-MA-153     | No Sample            |  | 0                   |  | 0                   | 0  | 0             | No Sample |    |    |    |    |               | 0         | 0  | 0  | 0  | 1  | 0              | 0  | 0             | 0  | 0  | 0      | 4      | 0    | 0   | 5  |   |   |   |
| 03-JR-MA-154     | 0                    |  | 0                   |  | 0                   | 4  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 1  | 0              | 0  | 0             | 0  | 0  | 30     | 60     | 0    | 61  |    |   |   |   |
| 03-JR-MA-155     | No Sample            |  | 0                   |  | 0                   | 9  | 0             | No Sample |    |    |    |    |               | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 1             | 0  | 0  | 1      | 0      | 0    | 2   | 2  |   |   |   |
| 03-JR-MA-156     | No Sample            |  | 0                   |  | 0                   | 2  | 0             | No Sample |    |    |    |    |               | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 0      | 12     | 0    | 0   | 12 |   |   |   |
| 03-JR-MA-157     | 0                    |  | 0                   |  | 0                   | 10 | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 16     | 0      | 0    | 16  |    |   |   |   |
| 03-JR-MA-158     | 0                    |  | 0                   |  | 0                   | 3  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 30     | 60     | 0    | 60  |    |   |   |   |
| 03-JR-MA-159     | No Sample            |  | No Sample           |  | 1                   | 0  | No Sample     |           |    |    |    |    | No Sample     |           |    |    |    |    | 0              | 0  | 0             | 0  | 0  | 0      | 0      | 0    | 0   | 0  | 0 | 0 |   |
| 03-JR-MA-160     | 0                    |  | 1                   |  | 0                   | 10 | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 30     | 0      | 0    | 30  |    |   |   |   |
| 03-JR-MA-161     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 2      | 0      | 0    | 2   |    |   |   |   |
| 03-JR-MA-162     | 0                    |  | 0                   |  | 0                   | 5  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 20     | 40     | 0    | 40  |    |   |   |   |
| 03-JR-MA-163     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 0      | 0      | 0    | 0   | 0  |   |   |   |
| 03-JR-MA-164     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 0      | 0      | 0    | 0   | 0  |   |   |   |
| 03-JR-MA-165     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 46     | 0      | 0    | 46  |    |   |   |   |
| 03-JR-MA-166     | 0                    |  | 0                   |  | 0                   | 1  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 34     | 0      | 0    | 34  |    |   |   |   |
| 03-JR-MA-167     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 1  | 0              | 0  | 0             | 0  | 0  | 34     | 0      | 0    | 35  |    |   |   |   |
| 03-JR-MA-168     | 0                    |  | 0                   |  | 0                   | 1  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 4  | 0      | 0      | 4    | 4   |    |   |   |   |
| 03-JR-MA-169     | 0                    |  | 0                   |  | 0                   | 12 | 0             | 0         | 0  | 0  | 0  | 0  | 1             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 46 | 1000   | 0      | 1001 |     |    |   |   |   |
| 03-JR-MA-170     | No Sample            |  | 0                   |  | 0                   | 2  | 0             | No Sample |    |    |    |    |               | No Sample |    |    |    |    |                | 0  | 0             | 0  | 0  | 0      | 1      | 0    | 0   | 3  | 0 | 0 | 4 |
| 03-JR-MA-171     | 0                    |  | 0                   |  | 0                   | 5  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 40     | 120    | 0    | 120 |    |   |   |   |
| 03-JR-MA-172     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 0  | 5      | 0      | 0    | 5   |    |   |   |   |
| 03-JR-MA-173     | 0                    |  | 1                   |  | 0                   | 5  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 2  | 0              | 0  | 0             | 1  | 0  | 50     | 300    | 0    | 303 |    |   |   |   |
| 03-JR-MA-174     | 0                    |  | 0                   |  | 0                   | 1  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 3  | 0              | 0  | 0             | 0  | 0  | 50     | 150    | 0    | 153 |    |   |   |   |
| 03-JR-MA-175     | 0                    |  | 0                   |  | 0                   | 10 | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 17 | 0      | 0      | 0    | 17  |    |   |   |   |
| 03-JR-MA-176     | 0                    |  | 0                   |  | 0                   | 4  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 21 | 0      | 0      | 0    | 21  |    |   |   |   |
| 03-JR-MA-177     | 0                    |  | 0                   |  | 0                   | 3  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 30 | 60     | 0      | 60   |     |    |   |   |   |
| 03-JR-MA-178     | 0                    |  | 0                   |  | 0                   | 4  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 7  | 0              | 0  | 0             | 0  | 50 | 200    | 0      | 207  |     |    |   |   |   |
| 03-JR-MA-179     | 0                    |  | 0                   |  | 0                   | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 0  | 0              | 0  | 0             | 0  | 5  | 0      | 0      | 0    | 5   |    |   |   |   |
| 03-JR-MA-180     | 0                    |  | 0                   |  | 0                   | 2  | 0             | 0         | 0  | 0  | 0  | 0  | 0             | 0         | 0  | 0  | 0  | 1  | 0              | 0  | 0             | 0  | 31 | 80     | 0      | 81   |     |    |   |   |   |

# Appendix C. KIM Counts

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |    | KIM Count     |    |    |    |               |    |    |    |                |    |    |    |    |    | Total<br>KIMS |     |        |        |     |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|----|---------------|----|----|----|---------------|----|----|----|----------------|----|----|----|----|----|---------------|-----|--------|--------|-----|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |    | 1.0 to 2.0 mm |    |    |    | 0.5 to 1.0 mm |    |    |    | 0.25 to 0.5 mm |    |    |    |    |    |               |     |        |        |     |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | GP | GO            | DC | IM | CR | FO            | GP | GO | DC | IM             | CR | FO | GP | GO | DC |               | IM  | CR (p) | CR (e) | FO  |
| 03-JR-MA-181     | 0                    |                     | 0                   | 2                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 23  | 0      | 0      | 23  |
| 03-JR-MA-182     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 3   | 0      | 0      | 3   |
| 03-JR-MA-183     | 0                    |                     | 0                   | 2                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 35  | 80     | 0      | 80  |
| 03-JR-MA-184     | 0                    |                     | 0                   | 1                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 2   | 0      | 0      | 2   |
| 03-JR-MA-185     | 0                    |                     | 0                   | 1                   | 0                   | 0  | 0             | 0  | 11 | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 19 | 0  | 0  | 0  | 0             | 110 | 600    | 0      | 630 |
| 03-JR-MA-186     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 3  | 0  | 0  | 0  | 0             | 22  | 0      | 0      | 22  |
| 03-JR-MA-187     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 27  | 0      | 0      | 27  |
| 03-JR-MA-188     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 5  | 0  | 0  | 0  | 0             | 30  | 125    | 0      | 130 |
| 03-JR-MA-189     | 0                    |                     | 0                   | 2                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 11  | 0      | 0      | 11  |
| 03-JR-MA-190     | 0                    |                     | 0                   | 1                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 9   | 0      | 0      | 9   |
| 03-JR-MA-191     | 0                    |                     | 0                   | 2                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 6   | 0      | 0      | 6   |
| 03-JR-MA-192     | 0                    |                     | 0                   | 1                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 30  | 50     | 0      | 50  |
| 03-JR-MA-193     | 0                    |                     | 0                   | 15                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 2  | 0  | 0             | 10  | 0      | 0      | 12  |
| 03-JR-MA-194     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 17  | 0      | 0      | 17  |
| 03-JR-MA-195     | 0                    |                     | 0                   | 22                  | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 0  | 0  | 0             | 12  | 30     | 0      | 31  |
| 03-JR-MA-196     | No Sample            |                     | 0                   | 4                   | 0                   | 0  | No Sample     |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0   | 0      | 0      | 0   |
| 03-JR-MA-197     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 1  | 0  | 0             | 40  | 80     | 0      | 81  |
| 03-JR-MA-198     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 10  | 0      | 0      | 10  |
| 03-JR-MA-199     | 0                    |                     | 0                   | 3                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 3  | 0  | 0  | 0  | 0             | 30  | 500    | 0      | 503 |
| 03-JR-MA-200     | 0                    |                     | 0                   | 4                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 21  | 0      | 0      | 21  |
| 03-JR-MA-201     | 0                    | 1                   | 0                   | 2                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 0  | 0  | 0             | 35  | 150    | 0      | 151 |
| 03-JR-MA-202     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 13  | 0      | 0      | 13  |
| 03-JR-MA-203     | 0                    | 1                   | 0                   | 5                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 14  | 0      | 0      | 14  |
| 03-JR-MA-204     | No Sample            | 1                   | 0                   | 8                   | 0                   | 0  | No Sample     |    |    |    | 0             | 0  | 0  | 0  | 1              | 0  | 0  | 0  | 0  | 0  | 0             | 0   | 0      | 0      | 1   |
| 03-JR-MA-205     | 0                    |                     | 0                   | 0                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 8   | 0      | 0      | 8   |
| 03-JR-MA-206     | No Sample            |                     | 0                   | 0                   | 0                   | 0  | No Sample     |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0   | 0      | 0      | 0   |
| 03-JR-MA-207     | No Sample            |                     | 0                   | 0                   | 1                   | 0  | No Sample     |    |    |    | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0   | 0      | 0      | 0   |
| 03-JR-MA-208     | No Sample            | No Sample           |                     | 0                   | 0                   | 0  | No Sample     |    |    |    | No Sample     |    |    |    | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0   | 0      | 0      | 0   |
| 03-JR-MA-209     | 0                    |                     | 0                   | 2                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0  | 0             | 0   | 0      | 0      | 0   |
| 03-JR-MA-210     | 0                    |                     | 0                   | 6                   | 0                   | 0  | 0             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 1  | 0  | 0             | 20  | 50     | 0      | 52  |



| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     | KIM Count |               |    |    |    |    |               |    |    |    |    |                |    |    |    |    |        | Total<br>KIMS |        |     |    |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|-----------|---------------|----|----|----|----|---------------|----|----|----|----|----------------|----|----|----|----|--------|---------------|--------|-----|----|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |           | 1.0 to 2.0 mm |    |    |    |    | 0.5 to 1.0 mm |    |    |    |    | 0.25 to 0.5 mm |    |    |    |    |        |               |        |     |    |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | GP        | GO            | DC | IM | CR | FO | GP            | GO | DC | IM | CR | FO             | GP | GO | DC | IM | CR (p) |               | CR (e) | FO  |    |
| 03-JR-MA-211     | 0                    | 0                   | 0                   | 5                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 0  | 0      | 49            | 0      | 0   | 50 |
| 03-JR-MA-212     | No Sample            |                     | 0                   | 1                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 1             | 0      | 1   |    |
| 03-JR-MA-213     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 16     | 0             | 0      | 16  |    |
| 03-JR-MA-214     | 0                    | 0                   | 0                   | 2                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 1      | 0             | 0      | 1   |    |
| 03-JR-MA-215     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-216     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 1             | 0      | 1   |    |
| 03-JR-MA-217     | 0                    | 0                   | 0                   | 6                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 17     | 0             | 0      | 17  |    |
| 03-JR-MA-218     | 0                    | 2                   | 0                   | 10                  | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 5              | 0  | 0  | 0  | 0  | 53     | 150           | 0      | 155 |    |
| 03-JR-MA-219     | 0                    | 0                   | 0                   | 4                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 25     | 50            | 0      | 50  |    |
| 03-JR-MA-220     | 0                    | 0                   | 0                   | 3                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 50     | 80            | 0      | 80  |    |
| 03-JR-MA-221     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 1      | 0             | 0      | 1   |    |
| 03-JR-MA-222     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1              | 0  | 0  | 0  | 0  | 20     | 150           | 0      | 151 |    |
| 03-JR-MA-223     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1              | 0  | 0  | 0  | 0  | 15     | 25            | 0      | 26  |    |
| 03-JR-MA-224     | 0                    | 0                   | 0                   | 3                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 1  | 0  | 1  | 12     | 0             | 0      | 14  |    |
| 03-JR-MA-225     | No Sample            | 0                   | 0                   | 0                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-226     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 35     | 0             | 0      | 35  |    |
| 03-JR-MA-227     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-228     | 0                    | 1                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1              | 0  | 0  | 0  | 0  | 29     | 0             | 0      | 30  |    |
| 03-JR-MA-229     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1              | 0  | 0  | 0  | 0  | 1      | 0             | 0      | 2   |    |
| 03-JR-MA-230     | 0                    | 0                   | 0                   | 3                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1              | 0  | 0  | 0  | 0  | 20     | 40            | 0      | 41  |    |
| 03-JR-MA-231     | 0                    | 0                   | 0                   | 2                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 2      | 0             | 0      | 2   |    |
| 03-JR-MA-232     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1              | 1  | 0  | 0  | 0  | 20     | 80            | 0      | 82  |    |
| 03-JR-MA-233     | No Sample            | 0                   | 0                   | 1                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-234     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-235     | No Sample            | 0                   | 0                   | 0                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-236     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   |    |
| 03-JR-MA-237     | 0                    | 0                   | 0                   | 2                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 20     | 40            | 0      | 40  |    |
| 03-JR-MA-238     | No Sample            | 0                   | 0                   | 1                   | 0                   | No Sample |               |    |    |    | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 0      | 0             | 0      | 0   | 0  |
| 03-JR-MA-239     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0              | 0  | 0  | 0  | 0  | 35     | 0             | 0      | 35  |    |
| 03-JR-MA-240     | 0                    | 1                   | 0                   | 5                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0  | 3             | 1  | 0  | 4  | 0  | 0              | 7  | 1  | 4  | 1  | 27     | 40            | 0      | 61  |    |

# Appendix C. KIM Counts

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |                     | KIM Count     |           |           |           |               |           |           |           |                |           |           |           |     |     | Total<br>KIMS |     |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------|-----------|-----------|-----------|---------------|-----------|-----------|-----------|----------------|-----------|-----------|-----------|-----|-----|---------------|-----|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |                     | 1.0 to 2.0 mm |           |           |           | 0.5 to 1.0 mm |           |           |           | 0.25 to 0.5 mm |           |           |           |     |     |               |     |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP            | GO        | DC        | IM        | CR            | FO        | GP        | GO        | DC             | IM        | CR        | (p)       | CR  | (e) |               | FO  |
| 03-JR-MA-241     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 40  | 200 | 0             | 202 |
| 03-JR-MA-242     | No Sample            | No Sample           | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 0   | 0   | 0             | 0   |
| 03-JR-MA-243     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 20  | 50  | 0             | 51  |
| 03-JR-MA-244     | No Sample            | No Sample           | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 0   | 0   | 0             | 0   |
| 03-JR-MA-245     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 0   | 0   | 0             | 0   |
| 03-JR-MA-246     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 0   | 0   | 0             | 0   |
| 03-JR-MA-247     | 0                    | 0                   | 0                   | 2                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 40  | 0   | 0             | 40  |
| 03-JR-MA-248     | No Sample            | 0                   | 0                   | 2                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 5   | 0   | 0             | 5   |
| 03-JR-MA-249     | 0                    | 1                   | 0                   | 22                  | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 0         | 50  | 150 | 0             | 150 |
| 03-JR-MA-250     | No Sample            | No Sample           | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 0   | 0   | 0             | 0   |
| 03-JR-MA-251     | 0                    | 0                   | 0                   | 33                  | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 1         | 0         | 0         | 0              | 0         | 0         | 1         | 45  | 0   | 0             | 52  |
| 03-JR-MA-252     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 0   | 0   | 0             | 0   |
| 03-JR-MA-253     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 1         | 0   | 0   | 1             |     |
| 03-JR-MA-254     | 0                    | 0                   | 0                   | 16                  | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 1         | 0              | 0         | 0         | 50        | 100 | 0   | 101           |     |
| 03-JR-MA-255     | 0                    | 0                   | 0                   | 10                  | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 1         | 0   | 0   | 1             |     |
| 03-JR-MA-256     | 13                   | 20                  | 200                 | 30                  | 6000                | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 24        | 0   | 0   | 24            |     |
| 03-JR-MA-257     | No Sample            | No Sample           | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | No Sample | 0   | 0   | 0             | 0   |
| 03-JR-MA-258     | 0                    | 0                   | 0                   | 2                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 11        | 0   | 0   | 11            |     |
| 03-JR-MA-259     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 2         | 0   | 0   | 2             |     |
| 03-JR-MA-260     | No Sample            | 0                   | 0                   | 3                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | 0         | 0   | 0   | 0             | 0   |
| 03-JR-MA-261     | 0                    | 2                   | 0                   | 9                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 8         | 0   | 0   | 8             |     |
| 03-JR-MA-262     | 0                    | 1                   | 0                   | 46                  | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 50        | 70  | 0   | 70            |     |
| 03-JR-MA-263     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 3         | 0   | 0   | 3             |     |
| 03-JR-MA-264     | 0                    | 2                   | 0                   | 27                  | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 30        | 50  | 0   | 50            |     |
| 03-JR-MA-265     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | 0         | 0   | 0   | 0             | 0   |
| 03-JR-MA-266     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 2         | 0         | 0         | 0              | 0         | 0         | 30        | 50  | 0   | 52            |     |
| 03-JR-MA-267     | No Sample            | No Sample           | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | 0         | 0   | 0   | 0             | 0   |
| 03-JR-MA-268     | No Sample            | 0                   | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | 0         | 0   | 0   | 0             | 0   |
| 03-JR-MA-269     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0         | 0         | 0         | 0             | 0         | 0         | 0         | 0              | 0         | 0         | 4         | 0   | 0   | 4             |     |
| 03-JR-MA-270     | No Sample            | No Sample           | 0                   | 0                   | 0                   | 0                   | No Sample     | No Sample | No Sample | No Sample | No Sample     | No Sample | No Sample | No Sample | No Sample      | No Sample | No Sample | 0         | 0   | 0   | 0             | 1   |



| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     | KIM Count |               |    |    |    |           |               |    |    |    |           |                |    |    |    | Total<br>KIMS |    |        |        |      |   |   |   |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|-----------|---------------|----|----|----|-----------|---------------|----|----|----|-----------|----------------|----|----|----|---------------|----|--------|--------|------|---|---|---|
|                  | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25- 0.5 mm        |           | 1.0 to 2.0 mm |    |    |    |           | 0.5 to 1.0 mm |    |    |    |           | 0.25 to 0.5 mm |    |    |    |               |    |        |        |      |   |   |   |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | GP        | GO            | DC | IM | CR | FO        | GP            | GO | DC | IM | CR        | FO             | GP | GO | DC |               | IM | CR (p) | CR (e) | FO   |   |   |   |
| 03-JR-MA-271     | 0                    | 0                   | 0                   | 4                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 0  | 0      | 0      | 0    |   |   |   |
| 03-JR-MA-272     | No Sample            | 0                   | 0                   | 29                  | 0                   | No Sample |               |    |    |    |           | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 3  | 0      | 2      | 5    |   |   |   |
| 03-JR-MA-273     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 2  | 0      | 0      | 2    |   |   |   |
| 03-JR-MA-274     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 13 | 0      | 0      | 13   |   |   |   |
| 03-JR-MA-275     | 0                    | 2                   | 0                   | 13                  | 0                   | 0         | 0             | 0  | 0  | 1  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 50 | 100    | 0      | 101  |   |   |   |
| 03-JR-MA-276     | 1                    | 0                   | 0                   | 5                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 3              | 0  | 0  | 0  | 0             | 20 | 50     | 0      | 53   |   |   |   |
| 03-JR-MA-277     | 0                    | 0                   | 0                   | 11                  | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 20 | 0      | 0      | 20   |   |   |   |
| 03-JR-MA-278     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 44 | 0      | 0      | 44   |   |   |   |
| 03-JR-MA-279     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 20 | 40     | 0      | 40   |   |   |   |
| 03-JR-MA-280     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample | No Sample     |    |    |    |           | No Sample     |    |    |    |           | No Sample      |    |    |    |               | 0  | 0      | 0      | 0    | 0 | 0 | 0 |
| 03-JR-MA-281     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample | No Sample     |    |    |    |           | No Sample     |    |    |    |           | No Sample      |    |    |    |               | 0  | 0      | 0      | 0    | 0 | 0 | 0 |
| 03-JR-MA-282     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample | No Sample     |    |    |    |           | No Sample     |    |    |    |           | No Sample      |    |    |    |               | 0  | 0      | 0      | 0    | 0 | 0 | 0 |
| 03-JR-MA-283     | 0                    | 0                   | 0                   | 4                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 26 | 0      | 0      | 26   |   |   |   |
| 03-JR-MA-284     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 1  | 0      | 0      | 1    |   |   |   |
| 03-JR-MA-285     | 0                    | 0                   | 0                   | 17                  | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 5  | 0      | 0      | 5    |   |   |   |
| 03-JR-MA-286     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 15 | 0      | 0      | 15   |   |   |   |
| 03-JR-MA-287     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 2              | 0  | 0  | 0  | 0             | 21 | 60     | 0      | 62   |   |   |   |
| 03-JR-MA-288     | 0                    | 2                   | 0                   | 10                  | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 1  | 0             | 31 | 0      | 0      | 32   |   |   |   |
| 03-JR-MA-289     | 0                    | 0                   | 0                   | 6                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 2  | 0      | 0      | 2    |   |   |   |
| 03-JR-MA-290     | 0                    | 0                   | 0                   | 9                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 1  | 0             | 50 | 500    | 0      | 501  |   |   |   |
| 03-JR-MA-291     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 30 | 70     | 0      | 70   |   |   |   |
| 03-JR-MA-292     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 4              | 0  | 3  | 0  | 0             | 20 | 1000   | 0      | 1007 |   |   |   |
| 03-JR-MA-293     | No Sample            | 0                   | 0                   | 3                   | 0                   | No Sample |               |    |    |    | No Sample |               |    |    |    | No Sample |                |    |    |    | 0             | 0  | 0      | 0      | 0    | 0 | 0 |   |
| 03-JR-MA-294     | 0                    | 0                   | 0                   | 0                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 4              | 0  | 1  | 0  | 0             | 31 | 200    | 0      | 205  |   |   |   |
| 03-JR-MA-295     | 0                    | 0                   | 0                   | 7                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 19 | 0      | 0      | 19   |   |   |   |
| 03-JR-MA-296     | 0                    | 1                   | 0                   | 2                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 9              | 0  | 0  | 0  | 0             | 30 | 1000   | 0      | 1009 |   |   |   |
| 03-JR-MA-297     | No Sample            | No Sample           | 0                   | 0                   | 0                   | No Sample |               |    |    |    | No Sample |               |    |    |    | No Sample |                |    |    |    | 0             | 0  | 0      | 0      | 0    | 0 | 0 |   |
| 03-JR-MA-298     | 0                    | 0                   | 0                   | 3                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 24             | 0  | 0  | 0  | 0             | 50 | 1000   | 0      | 1024 |   |   |   |
| 03-JR-MA-299     | 0                    | 0                   | 0                   | 2                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 3  | 0      | 0      | 3    |   |   |   |
| 03-JR-MA-300     | 0                    | 0                   | 0                   | 1                   | 0                   | 0         | 0             | 0  | 0  | 0  | 0         | 0             | 0  | 0  | 0  | 0         | 0              | 0  | 0  | 0  | 0             | 20 | 200    | 0      | 200  |   |   |   |

# Appendix C. KIM Counts

| SAMPLE<br>NUMBER |           | Selected Pseudo KIMS |                     |                     |                     |                     |                     | KIM Count     |    |    |    |    |    |               |    |    |    |    |           |                |    | Total<br>KIMS |    |    |        |        |      |
|------------------|-----------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------|----|----|----|----|----|---------------|----|----|----|----|-----------|----------------|----|---------------|----|----|--------|--------|------|
|                  |           | 1.0-2.0 mm           |                     | 0.5-1.0 mm          |                     | 0.25-0.5 mm         |                     | 1.0 to 2.0 mm |    |    |    |    |    | 0.5 to 1.0 mm |    |    |    |    |           | 0.25 to 0.5 mm |    |               |    |    |        |        |      |
|                  |           | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP            | GO | DC | IM | CR | FO | GP            | GO | DC | IM | CR | FO        | GP             | GO |               | DC | IM | CR (p) | CR (e) | FO   |
| 03-JR-MA-301     | No Sample | 0                    | 0                   | 0                   | 0                   | 0                   | No Sample           |               |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 2  | 0      | 0      | 2    |
| 03-JR-MA-302     | 0         | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1         | 0              | 0  | 0             | 0  | 20 | 40     | 1      | 42   |
| 03-JR-MA-303     | 0         | 0                    | 0                   | 0                   | 1                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 0  | 0      | 0      | 0    |
| 03-JR-MA-304     | 0         | 0                    | 0                   | 0                   | 7                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 20 | 80     | 0      | 80   |
| 03-JR-MA-305     | No Sample | No Sample            |                     |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    | No Sample |                |    |               | 0  | 0  | 0      | 0      | 0    |
| 03-JR-MA-306     | No Sample | No Sample            |                     |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    | No Sample |                |    |               | 0  | 0  | 0      | 0      | 0    |
| 03-JR-MA-307     | No Sample | No Sample            |                     |                     |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | No Sample     |    |    |    |    | No Sample |                |    |               | 0  | 0  | 0      | 1      | 0    |
| 03-JR-MA-308     | No Sample |                      | 0                   | 0                   |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 1  | 0      | 0      | 1    |
| 03-JR-MA-309     | 0         | 0                    | 0                   | 9                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 9         | 0              | 0  | 1             | 0  | 61 | 800    | 0      | 810  |
| 03-JR-MA-310     | 0         | 0                    | 0                   | 1                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 20 | 300    | 0      | 300  |
| 03-JR-MA-312     | No Sample | 0                    | 0                   | 0                   |                     | 0                   | 0                   | No Sample     |    |    |    |    |    | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 1  | 0  | 0      | 0      | 1    |
| 03-JR-MA-313     | 0         | 0                    | 0                   | 3                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 5  | 0      | 0      | 5    |
| 03-JR-MA-314     | 0         | 1                    | 0                   | 1                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 50 | 100    | 0      | 100  |
| 03-JR-MA-315     | 0         | 0                    | 0                   | 1                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 6  | 0      | 0      | 6    |
| 03-JR-MA-316     | 0         | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 20 | 60     | 0      | 60   |
| 03-JR-MA-317     | 0         | 1                    | 0                   | 13                  | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1         | 0              | 2  | 0             | 0  | 50 | 80     | 0      | 83   |
| 03-JR-BD-001     | 0         | 1                    | 0                   | 3                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 1  | 0      | 0      | 1    |
| 03-JR-BD-002     | 0         | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1         | 0              | 0  | 0             | 0  | 2  | 0      | 0      | 3    |
| 03-JR-BD-003     | 0         | 0                    | 0                   | 6                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 7  | 0      | 0      | 7    |
| 03-JR-BD-004     | 0         | 0                    | 0                   | 3                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 0  | 0      | 0      | 0    |
| 03-JR-BD-005     | 0         | 1                    | 0                   | 11                  | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 2  | 0             | 0  | 14 | 0      | 0      | 16   |
| 03-JR-BD-006     | 0         | 0                    | 0                   | 25                  | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 10 | 0      | 0      | 10   |
| 03-JR-BD-007     | 0         | 0                    | 0                   | 2                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 6  | 0      | 0      | 6    |
| 03-JR-BD-008     | 0         | 0                    | 0                   | 4                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 3         | 0              | 0  | 0             | 0  | 40 | 250    | 0      | 253  |
| 03-JR-BD-009     | 0         | 2                    | 0                   | 13                  | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 29        | 0              | 0  | 1             | 0  | 50 | 1000   | 0      | 1030 |
| 03-JR-BD-010     | 0         | 0                    | 0                   | 1                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 25 | 50     | 0      | 50   |
| 03-JR-BD-011     | 0         | 0                    | 0                   | 2                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 0  | 0             | 0  | 13 | 0      | 0      | 13   |
| 03-JR-BD-012     | 0         | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1         | 0              | 0  | 0             | 0  | 35 | 200    | 0      | 201  |
| 03-JR-SG-001     | 0         | 0                    | 0                   | 9                   | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 1         | 0              | 2  | 0             | 1  | 41 | 0      | 0      | 45   |
| 03-JR-SG-002     | 0         | 0                    | 0                   | 19                  | 0                   | 0                   | 0                   | 0             | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0         | 0              | 1  | 0             | 0  | 3  | 0      | 0      | 4    |

Appendix C. KIM Counts

| SAMPLE<br>NUMBER | Selected Pseudo KIMS |                     |                     |                     |                     |                     |             |    |    |    | KIM Count     |    |    |    |    |    |    |    |               |    |    |    |        |        |     |     | Total<br>KIMs |                |  |  |  |  |  |  |  |
|------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------------|----|----|----|---------------|----|----|----|----|----|----|----|---------------|----|----|----|--------|--------|-----|-----|---------------|----------------|--|--|--|--|--|--|--|
|                  | 1.0-2.0 mm           |                     |                     | 0.5-1.0 mm          |                     |                     | 0.25-0.5 mm |    |    |    | 1.0 to 2.0 mm |    |    |    |    |    |    |    | 0.5 to 1.0 mm |    |    |    |        |        |     |     |               | 0.25 to 0.5 mm |  |  |  |  |  |  |  |
|                  | Low-Cr<br>Diop.      | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (p) | Low-Cr<br>Diop. (e) | Low-Cr<br>Diop. (e) | GP          | GO | DC | IM | CR            | FO | GP | GO | DC | IM | CR | FO | GP            | GO | DC | IM | CR (p) | CR (e) | FO  |     |               |                |  |  |  |  |  |  |  |
|                  |                      |                     |                     |                     |                     |                     |             |    |    |    |               |    |    |    |    |    |    |    |               |    |    |    |        |        |     |     |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-003     | 0                    | 0                   | 0                   | 10                  | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 10     | 0   | 0   | 10            |                |  |  |  |  |  |  |  |
| 03-JR-SG-004     | No Sample            | 0                   | 0                   | 1                   | 0                   | 0                   | No Sample   | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 0      | 0   | 0   | 0             |                |  |  |  |  |  |  |  |
| 03-JR-SG-005     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 2  | 1  | 0      | 0      | 2   | 0   | 0             | 6              |  |  |  |  |  |  |  |
| 03-JR-SG-006     | 0                    | 0                   | 0                   | 8                   | 0                   | 0                   |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0      | 3      | 13  | 0   | 0             | 17             |  |  |  |  |  |  |  |
| 03-JR-SG-007     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 7      | 35  | 0   | 0             | 42             |  |  |  |  |  |  |  |
| 03-JR-SG-008     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 0      | 10  | 0   | 0             | 10             |  |  |  |  |  |  |  |
| 03-JR-SG-009     | 0                    | 3                   | 0                   | 11                  | 0                   | 0                   |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 1  | 1  | 0      | 0      | 20  | 0   | 0             | 23             |  |  |  |  |  |  |  |
| 03-JR-SG-010     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 7             | 0  | 0  | 0  | 100    | 300    | 1   | 309 |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-011     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 3             | 0  | 0  | 0  | 20     | 150    | 0   | 153 |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-012     | 0                    | 4                   | 0                   | 10                  | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 1             | 1  | 1  | 3  | 32     | 0      | 0   | 39  |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-013     | 0                    | 1                   | 0                   | 3                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 4  | 0             | 0  | 0  | 0  | 20     | 150    | 0   | 154 |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-014     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 2      | 0      | 0   | 2   |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-015     | 0                    | 0                   | 0                   | 15                  | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 1  | 2  | 2  | 40     | 100    | 0   | 105 |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-016     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 60     | 120    | 0   | 120 |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-017     | 0                    | 1                   | 0                   | 10                  | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 1             | 0  | 0  | 0  | 6      | 0      | 0   | 7   |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-018     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 15     | 0      | 0   | 15  |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-019     | 0                    | 0                   | 0                   | 2                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 2             | 0  | 0  | 0  | 7      | 0      | 0   | 10  |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-020     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0             | 1  | 0  | 0  | 9      | 0      | 5   | 15  |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-021     | 0                    | 0                   | 0                   | 4                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 7      | 0      | 0   | 8   |               |                |  |  |  |  |  |  |  |
| 03-JR-SG-022     | 0                    | 0                   | 0                   | 3                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 1  | 0  | 24     | 40     | 0   | 41  |               |                |  |  |  |  |  |  |  |
| 03-JR-TM-001     | 0                    | 0                   | 0                   | 5                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 40     | 150    | 0   | 150 |               |                |  |  |  |  |  |  |  |
| 03-JR-TM-002     | 0                    | 0                   | 0                   | 0                   | 0                   | 0                   | 0           | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 23 | 150    | 1      | 151 |     |               |                |  |  |  |  |  |  |  |
| 03-JR-TM-003     | No Sample            | No Sample           | No Sample           | 0                   | 0                   | No Sample           | No Sample   | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 0      | 0   | 0   |               |                |  |  |  |  |  |  |  |
| 03-JR-TM-004     | 0                    | 0                   | 0                   | 1                   | 0                   |                     |             | 0  | 0  | 0  | 0             | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 40     | 80  | 0   | 81            |                |  |  |  |  |  |  |  |
| 03-JR-TM-005     | 0                    | 0                   | 0                   | 3                   | 0                   |                     |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 60     | 100 | 0   | 100           |                |  |  |  |  |  |  |  |
| 03-JR-TM-006     | 0                    | 0                   | 0                   | 14                  | 0                   |                     |             | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0             | 0  | 0  | 0  | 0      | 40     | 80  | 0   | 81            |                |  |  |  |  |  |  |  |

## Appendix E

### SUMMARY OF MICROPROBE DATA FOR INDICATOR MINERALS

#### Element Symbols

|    |           |
|----|-----------|
| Na | Sodium    |
| Mg | Magnesium |
| Al | Aluminum  |
| Si | Silicon   |
| Cr | Chromium  |
| Mn | Manganese |
| Ti | Titanium  |
| Fe | Iron      |

|    |           |
|----|-----------|
| Ni | Nickel    |
| Nb | Niobium   |
| V  | Vanadium  |
| Zn | Zinc      |
| O  | Oxygen    |
| Ca | Calcium   |
| K  | Potassium |

| Sample           | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO   | MnO   | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------|------------------|------------------|--------------------------------|--------------------------------|--------|-------|-------|--------|-------------------|------------------|---------|
| <b>GARNETS</b>   |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| <b>G10</b>       |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| 03-JR-MA-054-043 | 41.681           | 0.086            | 19.722                         | 5.548                          | 22.326 | 3.950 | 0.363 | 6.088  | 0.035             | 0.008            | 99.799  |
| 03-JR-MA-240-019 | 41.878           | 0.028            | 20.944                         | 4.076                          | 20.979 | 4.302 | 0.457 | 7.531  | 0.006             | 0.008            | 100.201 |
| <b>G9</b>        |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| 03-JR-4D-005-002 | 41.655           | 0.075            | 21.769                         | 2.517                          | 18.745 | 5.431 | 0.565 | 9.390  | 0.009             | 0.001            | 100.148 |
| 03-JR-4D-005-003 | 41.906           | 0.033            | 21.264                         | 3.637                          | 19.853 | 5.516 | 0.448 | 7.934  | 0.010             | 0.009            | 100.600 |
| 03-JR-MA-006-149 | 40.234           | 0.335            | 17.043                         | 8.336                          | 19.929 | 6.349 | 0.310 | 6.767  | 0.019             | 0.001            | 99.322  |
| 03-JR-MA-006-151 | 41.383           | 0.000            | 19.631                         | 5.645                          | 20.244 | 5.187 | 0.436 | 7.082  | 0.014             | 0.000            | 99.622  |
| 03-JR-MA-029-089 | 41.862           | 0.321            | 20.525                         | 3.624                          | 21.299 | 4.817 | 0.282 | 7.093  | 0.046             | 0.000            | 99.868  |
| 03-JR-MA-048-041 | 41.553           | 0.186            | 19.845                         | 4.746                          | 20.290 | 5.137 | 0.397 | 7.786  | 0.025             | 0.008            | 99.973  |
| 03-JR-MA-048-042 | 41.798           | 0.175            | 20.304                         | 4.274                          | 20.783 | 4.791 | 0.369 | 7.363  | 0.021             | 0.002            | 99.879  |
| 03-JR-MA-048-043 | 40.348           | 0.234            | 17.722                         | 7.422                          | 18.230 | 6.770 | 0.475 | 7.969  | 0.047             | 0.000            | 99.216  |
| 03-JR-MA-050-007 | 41.453           | 0.067            | 20.564                         | 4.331                          | 20.374 | 5.133 | 0.435 | 7.483  | 0.025             | 0.000            | 99.865  |
| 03-JR-MA-050-008 | 41.088           | 0.033            | 19.067                         | 5.890                          | 17.868 | 6.657 | 0.474 | 8.902  | 0.030             | 0.000            | 100.008 |
| 03-JR-MA-050-010 | 41.747           | 0.355            | 20.746                         | 3.821                          | 21.235 | 4.904 | 0.271 | 6.607  | 0.026             | 0.000            | 99.712  |
| 03-JR-MA-052-017 | 41.370           | 0.000            | 20.484                         | 4.148                          | 20.427 | 4.794 | 0.504 | 7.606  | 0.025             | 0.000            | 99.359  |
| 03-JR-MA-052-018 | 41.667           | 0.170            | 18.596                         | 6.882                          | 21.107 | 5.376 | 0.315 | 6.116  | 0.020             | 0.002            | 100.251 |
| 03-JR-MA-052-020 | 41.674           | 0.314            | 21.038                         | 3.245                          | 20.527 | 4.751 | 0.427 | 7.721  | 0.041             | 0.004            | 99.742  |
| 03-JR-MA-052-021 | 41.345           | 0.031            | 21.001                         | 3.961                          | 20.488 | 4.724 | 0.520 | 7.918  | 0.016             | 0.000            | 100.002 |
| 03-JR-MA-052-022 | 41.555           | 0.000            | 20.146                         | 4.860                          | 20.013 | 5.185 | 0.471 | 7.851  | 0.019             | 0.004            | 100.104 |
| 03-JR-MA-052-024 | 41.427           | 0.223            | 19.385                         | 4.979                          | 19.635 | 5.308 | 0.476 | 8.580  | 0.032             | 0.000            | 100.044 |
| 03-JR-MA-052-025 | 42.090           | 0.268            | 21.852                         | 2.096                          | 20.735 | 4.499 | 0.360 | 8.172  | 0.043             | 0.000            | 100.114 |
| 03-JR-MA-052-026 | 40.919           | 0.034            | 19.839                         | 4.999                          | 17.902 | 5.385 | 0.484 | 10.330 | 0.018             | 0.000            | 99.908  |
| 03-JR-MA-052-027 | 41.980           | 0.255            | 21.970                         | 1.934                          | 20.312 | 4.501 | 0.431 | 8.307  | 0.041             | 0.000            | 99.730  |
| 03-JR-MA-052-028 | 41.947           | 0.308            | 20.514                         | 3.762                          | 21.181 | 4.857 | 0.289 | 6.699  | 0.032             | 0.005            | 99.595  |
| 03-JR-MA-054-039 | 41.258           | 0.031            | 20.943                         | 3.797                          | 20.759 | 4.535 | 0.490 | 7.359  | 0.006             | 0.000            | 99.178  |
| 03-JR-MA-054-040 | 40.908           | 0.114            | 20.571                         | 4.453                          | 19.906 | 5.759 | 0.449 | 7.243  | 0.013             | 0.003            | 99.418  |
| 03-JR-MA-054-041 | 42.124           | 0.119            | 21.873                         | 2.160                          | 20.952 | 4.477 | 0.378 | 8.131  | 0.018             | 0.000            | 100.232 |
| 03-JR-MA-054-042 | 41.552           | 0.084            | 20.354                         | 4.567                          | 20.005 | 4.971 | 0.522 | 7.996  | 0.030             | 0.000            | 100.081 |
| 03-JR-MA-054-044 | 40.498           | 0.065            | 19.084                         | 5.534                          | 16.954 | 6.847 | 0.591 | 9.966  | 0.010             | 0.002            | 99.549  |
| 03-JR-MA-054-045 | 41.795           | 0.004            | 21.054                         | 3.750                          | 20.458 | 4.825 | 0.512 | 7.698  | 0.012             | 0.000            | 100.108 |
| 03-JR-MA-054-046 | 41.933           | 0.028            | 21.729                         | 3.370                          | 21.054 | 4.462 | 0.485 | 7.171  | 0.018             | 0.000            | 100.249 |
| 03-JR-MA-054-047 | 41.849           | 0.085            | 21.144                         | 2.942                          | 20.431 | 4.708 | 0.392 | 8.101  | 0.028             | 0.000            | 99.678  |
| 03-JR-MA-054-048 | 41.520           | 0.000            | 20.023                         | 5.101                          | 20.469 | 4.887 | 0.479 | 7.360  | 0.014             | 0.000            | 99.852  |
| 03-JR-MA-054-049 | 41.631           | 0.213            | 19.112                         | 5.368                          | 20.844 | 5.840 | 0.263 | 6.324  | 0.000             | 0.002            | 99.596  |
| 03-JR-MA-054-050 | 41.642           | 0.133            | 20.515                         | 3.876                          | 19.928 | 5.006 | 0.433 | 8.023  | 0.028             | 0.000            | 99.583  |



| Sample           | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO   | MnO   | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------|------------------|------------------|--------------------------------|--------------------------------|--------|-------|-------|--------|-------------------|------------------|---------|
| <b>GARNETS</b>   |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| <b>G10</b>       |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| 03-JR-MA-054-043 | 41.681           | 0.086            | 19.722                         | 5.548                          | 22.326 | 3.950 | 0.363 | 6.088  | 0.035             | 0.000            | 99.799  |
| 03-JR-MA-240-019 | 41.878           | 0.028            | 20.944                         | 4.076                          | 20.979 | 4.302 | 0.457 | 7.531  | 0.006             | 0.000            | 100.201 |
| <b>G9</b>        |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| 03-JR-BD-005-002 | 41.655           | 0.075            | 21.769                         | 2.517                          | 18.745 | 5.431 | 0.565 | 9.390  | 0.000             | 0.001            | 100.148 |
| 03-JR-BD-005-003 | 41.906           | 0.033            | 21.264                         | 3.637                          | 19.853 | 5.516 | 0.448 | 7.934  | 0.010             | 0.000            | 100.600 |
| 03-JR-MA-006-149 | 40.234           | 0.335            | 17.043                         | 8.336                          | 19.929 | 6.349 | 0.310 | 6.767  | 0.019             | 0.001            | 99.322  |
| 03-JR-MA-006-151 | 41.383           | 0.000            | 19.631                         | 5.645                          | 20.244 | 5.187 | 0.436 | 7.082  | 0.014             | 0.000            | 99.622  |
| 03-JR-MA-029-089 | 41.862           | 0.321            | 20.525                         | 3.624                          | 21.299 | 4.817 | 0.282 | 7.093  | 0.046             | 0.000            | 99.868  |
| 03-JR-MA-048-041 | 41.553           | 0.186            | 19.845                         | 4.746                          | 20.290 | 5.137 | 0.397 | 7.786  | 0.025             | 0.008            | 99.973  |
| 03-JR-MA-048-042 | 41.798           | 0.175            | 20.304                         | 4.274                          | 20.783 | 4.791 | 0.369 | 7.363  | 0.021             | 0.002            | 99.879  |
| 03-JR-MA-048-043 | 40.348           | 0.234            | 17.722                         | 7.422                          | 18.230 | 6.770 | 0.475 | 7.969  | 0.047             | 0.000            | 99.216  |
| 03-JR-MA-050-007 | 41.453           | 0.067            | 20.564                         | 4.331                          | 20.374 | 5.133 | 0.435 | 7.483  | 0.025             | 0.000            | 99.865  |
| 03-JR-MA-050-008 | 41.088           | 0.033            | 19.067                         | 5.890                          | 17.868 | 6.657 | 0.474 | 8.902  | 0.030             | 0.000            | 100.008 |
| 03-JR-MA-050-010 | 41.747           | 0.355            | 20.746                         | 3.821                          | 21.235 | 4.904 | 0.271 | 6.607  | 0.026             | 0.000            | 99.712  |
| 03-JR-MA-052-017 | 41.370           | 0.000            | 20.484                         | 4.148                          | 20.427 | 4.794 | 0.504 | 7.606  | 0.025             | 0.000            | 99.359  |
| 03-JR-MA-052-018 | 41.667           | 0.170            | 18.596                         | 6.882                          | 21.107 | 5.376 | 0.315 | 6.116  | 0.020             | 0.002            | 100.251 |
| 03-JR-MA-052-020 | 41.674           | 0.314            | 21.038                         | 3.245                          | 20.527 | 4.751 | 0.427 | 7.721  | 0.041             | 0.004            | 99.742  |
| 03-JR-MA-052-021 | 41.345           | 0.031            | 21.001                         | 3.961                          | 20.488 | 4.724 | 0.520 | 7.918  | 0.016             | 0.000            | 100.002 |
| 03-JR-MA-052-022 | 41.555           | 0.000            | 20.146                         | 4.860                          | 20.013 | 5.185 | 0.471 | 7.851  | 0.019             | 0.004            | 100.104 |
| 03-JR-MA-052-024 | 41.427           | 0.223            | 19.385                         | 4.979                          | 19.635 | 5.308 | 0.476 | 8.580  | 0.032             | 0.000            | 100.044 |
| 03-JR-MA-052-025 | 42.090           | 0.268            | 21.852                         | 2.096                          | 20.735 | 4.499 | 0.360 | 8.172  | 0.043             | 0.000            | 100.114 |
| 03-JR-MA-052-026 | 40.919           | 0.034            | 19.839                         | 4.999                          | 17.902 | 5.385 | 0.484 | 10.330 | 0.018             | 0.000            | 99.908  |
| 03-JR-MA-052-027 | 41.980           | 0.255            | 21.970                         | 1.934                          | 20.312 | 4.501 | 0.431 | 8.307  | 0.041             | 0.000            | 99.730  |
| 03-JR-MA-052-028 | 41.947           | 0.308            | 20.514                         | 3.762                          | 21.181 | 4.857 | 0.289 | 6.699  | 0.032             | 0.005            | 99.595  |
| 03-JR-MA-054-039 | 41.258           | 0.031            | 20.943                         | 3.797                          | 20.759 | 4.535 | 0.490 | 7.359  | 0.006             | 0.000            | 99.178  |
| 03-JR-MA-054-040 | 40.908           | 0.114            | 20.571                         | 4.453                          | 19.906 | 5.759 | 0.449 | 7.243  | 0.013             | 0.003            | 99.418  |
| 03-JR-MA-054-041 | 42.124           | 0.119            | 21.873                         | 2.160                          | 20.952 | 4.477 | 0.378 | 8.131  | 0.018             | 0.000            | 100.232 |
| 03-JR-MA-054-042 | 41.552           | 0.084            | 20.354                         | 4.567                          | 20.005 | 4.971 | 0.522 | 7.996  | 0.030             | 0.000            | 100.081 |
| 03-JR-MA-054-044 | 40.498           | 0.065            | 19.084                         | 5.534                          | 16.954 | 6.847 | 0.591 | 9.966  | 0.010             | 0.002            | 99.549  |
| 03-JR-MA-054-045 | 41.795           | 0.004            | 21.054                         | 3.750                          | 20.458 | 4.825 | 0.512 | 7.698  | 0.012             | 0.000            | 100.108 |
| 03-JR-MA-054-046 | 41.933           | 0.028            | 21.729                         | 3.370                          | 21.054 | 4.462 | 0.485 | 7.171  | 0.018             | 0.000            | 100.249 |
| 03-JR-MA-054-047 | 41.849           | 0.085            | 21.144                         | 2.942                          | 20.431 | 4.708 | 0.392 | 8.101  | 0.028             | 0.000            | 99.678  |
| 03-JR-MA-054-048 | 41.520           | 0.000            | 20.023                         | 5.101                          | 20.469 | 4.887 | 0.479 | 7.360  | 0.014             | 0.000            | 99.852  |
| 03-JR-MA-054-049 | 41.631           | 0.213            | 19.112                         | 5.368                          | 20.844 | 5.840 | 0.263 | 6.324  | 0.000             | 0.002            | 99.596  |
| 03-JR-MA-054-050 | 41.642           | 0.133            | 20.515                         | 3.876                          | 19.928 | 5.006 | 0.433 | 8.023  | 0.028             | 0.000            | 99.583  |



# Appendix E. Chromites

| Sample           | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO   | MnO   | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------|------------------|------------------|--------------------------------|--------------------------------|--------|-------|-------|--------|-------------------|------------------|---------|
| 03-JR-MA-054-051 | 41.497           | 0.155            | 18.967                         | 5.912                          | 20.573 | 5.804 | 0.309 | 6.394  | 0.000             | 0.000            | 99.611  |
| 03-JR-MA-055-014 | 41.320           | 0.114            | 20.450                         | 4.536                          | 20.299 | 5.126 | 0.418 | 7.240  | 0.029             | 0.000            | 99.531  |
| 03-JR-MA-055-015 | 40.622           | 0.139            | 21.899                         | 1.558                          | 16.080 | 4.968 | 0.423 | 13.876 | 0.020             | 0.000            | 99.585  |
| 03-JR-MA-058-024 | 41.664           | 0.090            | 21.348                         | 3.526                          | 20.555 | 5.363 | 0.406 | 7.060  | 0.015             | 0.000            | 100.026 |
| 03-JR-MA-058-025 | 40.687           | 0.077            | 20.099                         | 5.005                          | 19.805 | 5.354 | 0.470 | 7.619  | 0.038             | 0.000            | 99.153  |
| 03-JR-MA-058-026 | 41.366           | 0.063            | 20.766                         | 4.011                          | 19.845 | 4.942 | 0.513 | 8.114  | 0.025             | 0.000            | 99.644  |
| 03-JR-MA-058-027 | 41.356           | 0.035            | 20.402                         | 4.785                          | 20.186 | 4.871 | 0.506 | 7.698  | 0.022             | 0.000            | 99.861  |
| 03-JR-MA-066-010 | 41.318           | 0.064            | 20.414                         | 3.745                          | 17.558 | 5.435 | 0.453 | 11.076 | 0.017             | 0.000            | 100.080 |
| 03-JR-MA-070-011 | 40.880           | 0.032            | 20.483                         | 3.539                          | 17.383 | 5.673 | 0.443 | 11.514 | 0.016             | 0.002            | 99.964  |
| 03-JR-MA-075-016 | 41.213           | 0.111            | 20.752                         | 3.923                          | 20.409 | 5.174 | 0.485 | 7.435  | 0.032             | 0.004            | 99.538  |
| 03-JR-MA-076-013 | 40.968           | 0.025            | 20.634                         | 4.026                          | 18.835 | 5.279 | 0.506 | 9.668  | 0.013             | 0.000            | 99.955  |
| 03-JR-MA-076-014 | 40.446           | 0.004            | 21.880                         | 1.906                          | 17.978 | 4.013 | 0.443 | 12.203 | 0.018             | 0.000            | 98.891  |
| 03-JR-MA-076-015 | 40.365           | 0.238            | 18.318                         | 6.457                          | 19.554 | 5.907 | 0.416 | 7.751  | 0.032             | 0.001            | 99.038  |
| 03-JR-MA-076-016 | 41.605           | 0.095            | 21.352                         | 3.335                          | 20.519 | 5.152 | 0.432 | 7.385  | 0.006             | 0.000            | 99.881  |
| 03-JR-MA-077-010 | 41.735           | 0.114            | 22.288                         | 2.108                          | 20.606 | 4.578 | 0.358 | 8.313  | 0.033             | 0.000            | 100.135 |
| 03-JR-MA-081-031 | 41.821           | 0.008            | 21.111                         | 3.743                          | 20.506 | 5.278 | 0.375 | 6.994  | 0.010             | 0.000            | 99.845  |
| 03-JR-MA-081-032 | 41.467           | 0.048            | 20.821                         | 4.144                          | 21.384 | 4.451 | 0.397 | 6.895  | 0.023             | 0.000            | 99.631  |
| 03-JR-MA-084-008 | 41.058           | 0.165            | 19.309                         | 5.553                          | 19.953 | 5.359 | 0.383 | 7.331  | 0.028             | 0.000            | 99.139  |
| 03-JR-MA-091-021 | 41.893           | 0.207            | 20.515                         | 3.724                          | 21.320 | 4.960 | 0.329 | 7.091  | 0.039             | 0.000            | 100.079 |
| 03-JR-MA-110-008 | 41.574           | 0.308            | 18.432                         | 7.401                          | 20.459 | 6.017 | 0.325 | 6.480  | 0.037             | 0.005            | 101.037 |
| 03-JR-MA-128-001 | 40.537           | 0.061            | 22.750                         | 0.151                          | 14.303 | 5.645 | 0.358 | 16.494 | 0.000             | 0.000            | 100.298 |
| 03-JR-MA-142-001 | 41.986           | 0.032            | 21.157                         | 3.322                          | 19.825 | 5.406 | 0.486 | 7.984  | 0.000             | 0.000            | 100.196 |
| 03-JR-MA-155-001 | 41.746           | 0.080            | 20.451                         | 4.839                          | 19.898 | 5.711 | 0.454 | 7.524  | 0.011             | 0.002            | 100.716 |
| 03-JR-MA-169-001 | 41.073           | 0.212            | 19.559                         | 5.143                          | 19.237 | 5.758 | 0.474 | 8.136  | 0.055             | 0.003            | 99.650  |
| 03-JR-MA-210-004 | 41.297           | 0.071            | 17.433                         | 8.014                          | 20.186 | 5.939 | 0.389 | 6.527  | 0.029             | 0.004            | 99.889  |
| 03-JR-MA-211-002 | 42.185           | 0.270            | 19.638                         | 5.394                          | 22.260 | 5.062 | 0.220 | 5.373  | 0.042             | 0.001            | 100.444 |
| 03-JR-MA-224-001 | 41.541           | 0.101            | 21.098                         | 3.473                          | 19.729 | 5.211 | 0.538 | 8.283  | 0.029             | 0.000            | 100.003 |
| 03-JR-MA-240-001 | 41.150           | 0.197            | 20.243                         | 4.411                          | 20.211 | 5.129 | 0.400 | 8.162  | 0.032             | 0.000            | 99.936  |
| 03-JR-MA-240-003 | 41.493           | 0.090            | 21.082                         | 3.756                          | 20.108 | 5.408 | 0.504 | 7.729  | 0.023             | 0.002            | 100.195 |
| 03-JR-MA-240-004 | 40.168           | 0.161            | 22.088                         | 0.277                          | 14.045 | 4.531 | 0.539 | 18.316 | 0.014             | 0.000            | 100.136 |
| 03-JR-MA-240-015 | 41.469           | 0.069            | 20.381                         | 4.800                          | 20.717 | 5.287 | 0.406 | 6.712  | 0.014             | 0.002            | 99.858  |
| 03-JR-MA-240-016 | 40.188           | 0.128            | 19.451                         | 4.869                          | 15.612 | 6.721 | 0.683 | 12.446 | 0.020             | 0.000            | 100.118 |
| 03-JR-MA-240-017 | 41.688           | 0.356            | 19.614                         | 4.941                          | 21.150 | 5.248 | 0.297 | 6.682  | 0.039             | 0.000            | 100.014 |
| 03-JR-MA-240-018 | 41.827           | 0.056            | 20.710                         | 4.569                          | 20.306 | 5.089 | 0.515 | 7.382  | 0.028             | 0.000            | 100.480 |
| 03-JR-MA-240-020 | 41.393           | 0.195            | 20.598                         | 4.239                          | 19.815 | 5.190 | 0.441 | 8.265  | 0.036             | 0.000            | 100.170 |
| 03-JR-MA-240-021 | 41.580           | 0.022            | 20.476                         | 4.717                          | 20.126 | 5.053 | 0.512 | 7.886  | 0.023             | 0.000            | 100.393 |
| 03-JR-MA-251-004 | 41.671           | 0.164            | 21.077                         | 3.373                          | 20.259 | 4.839 | 0.460 | 8.558  | 0.027             | 0.000            | 100.427 |
| 03-JR-MA-251-005 | 40.412           | 0.072            | 22.297                         | 0.240                          | 11.631 | 9.693 | 0.303 | 15.685 | 0.000             | 0.001            | 100.334 |

| Sample                            | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO   | MnO   | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|-----------------------------------|------------------|------------------|--------------------------------|--------------------------------|--------|-------|-------|--------|-------------------|------------------|---------|
| 03-JR-MA-254-002                  | 41.420           | 0.119            | 20.354                         | 4.613                          | 19.930 | 5.297 | 0.475 | 7.696  | 0.050             | 0.001            | 99.955  |
| 03-JR-MA-292-005                  | 41.990           | 0.094            | 22.032                         | 2.729                          | 20.619 | 4.670 | 0.472 | 8.024  | 0.009             | 0.000            | 100.640 |
| 03-JR-MA-292-006                  | 42.051           | 0.009            | 22.573                         | 1.743                          | 19.889 | 4.901 | 0.482 | 8.368  | 0.000             | 0.000            | 100.015 |
| 03-JR-MA-317-054                  | 41.331           | 0.256            | 20.442                         | 4.274                          | 20.329 | 5.135 | 0.368 | 7.829  | 0.030             | 0.000            | 99.994  |
| 03-JR-SG-001-002                  | 41.849           | 0.228            | 21.178                         | 3.236                          | 20.588 | 4.680 | 0.430 | 8.055  | 0.047             | 0.002            | 100.293 |
| 03-JR-SG-002-001                  | 41.785           | 0.161            | 20.036                         | 4.760                          | 20.255 | 5.164 | 0.441 | 7.804  | 0.048             | 0.007            | 100.460 |
| 03-JR-SG-005-003                  | 41.305           | 0.210            | 19.945                         | 4.797                          | 20.258 | 5.229 | 0.380 | 7.485  | 0.044             | 0.000            | 99.652  |
| 03-JR-SG-005-004                  | 41.373           | 0.000            | 21.011                         | 3.729                          | 20.390 | 4.643 | 0.478 | 7.920  | 0.007             | 0.001            | 99.552  |
| 03-JR-SG-009-005                  | 40.477           | 0.123            | 16.827                         | 9.338                          | 18.529 | 6.498 | 0.500 | 7.687  | 0.042             | 0.000            | 100.020 |
| 03-JR-SG-012-001                  | 41.732           | 0.060            | 20.716                         | 3.926                          | 20.534 | 5.102 | 0.397 | 7.818  | 0.013             | 0.003            | 100.301 |
| 03-JR-SG-012-007                  | 41.588           | 0.109            | 20.552                         | 4.159                          | 19.698 | 5.256 | 0.514 | 7.932  | 0.027             | 0.000            | 99.835  |
| 03-JR-SG-015-001                  | 41.897           | 0.045            | 22.035                         | 2.422                          | 20.804 | 4.621 | 0.386 | 7.882  | 0.015             | 0.000            | 100.107 |
| 03-JR-SG-021-001                  | 42.159           | 0.164            | 21.667                         | 2.458                          | 20.098 | 4.573 | 0.397 | 8.723  | 0.018             | 0.000            | 100.255 |
| <b>GROUP II ECLOGITIC GARNETS</b> |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| 03-JR-MA-006-147                  | 39.461           | 0.022            | 22.161                         | 0.027                          | 10.793 | 6.565 | 0.660 | 20.185 | 0.000             | 0.000            | 99.875  |
| 03-JR-MA-020-005                  | 39.417           | 0.032            | 22.783                         | 0.016                          | 11.390 | 8.086 | 0.383 | 17.621 | 0.000             | 0.000            | 99.727  |
| 03-JR-MA-054-033                  | 40.461           | 0.061            | 22.999                         | 0.197                          | 16.632 | 4.296 | 0.359 | 14.767 | 0.023             | 0.004            | 99.798  |
| 03-JR-MA-054-038                  | 39.365           | 0.002            | 22.264                         | 0.041                          | 11.900 | 5.692 | 0.372 | 19.887 | 0.000             | 0.001            | 99.523  |
| 03-JR-MA-124-001                  | 40.349           | 0.075            | 22.610                         | 0.058                          | 13.904 | 6.734 | 0.512 | 15.778 | 0.000             | 0.000            | 100.021 |
| 03-JR-MA-251-007                  | 39.992           | 0.029            | 22.360                         | 0.001                          | 10.343 | 8.381 | 0.449 | 19.206 | 0.000             | 0.000            | 100.761 |
| 03-JR-MA-292-034                  | 39.957           | 0.045            | 22.543                         | 0.015                          | 12.897 | 5.505 | 0.419 | 18.885 | 0.000             | 0.001            | 100.267 |
| 03-JR-MA-309-089                  | 39.779           | 0.043            | 22.441                         | 0.069                          | 11.889 | 5.724 | 0.436 | 19.742 | 0.009             | 0.000            | 100.132 |
| <b>CR-POOR MEGACRYSTS</b>         |                  |                  |                                |                                |        |       |       |        |                   |                  |         |
| 03-JR-BD-009-081                  | 41.385           | 0.857            | 20.961                         | 2.136                          | 20.457 | 4.894 | 0.344 | 9.201  | 0.065             | 0.000            | 100.301 |
| 03-JR-MA-024-098                  | 42.231           | 0.510            | 21.034                         | 2.016                          | 21.977 | 4.519 | 0.249 | 7.204  | 0.056             | 0.007            | 99.802  |
| 03-JR-MA-048-040                  | 41.347           | 0.717            | 21.988                         | 0.139                          | 19.236 | 4.312 | 0.395 | 11.441 | 0.078             | 0.000            | 99.652  |
| 03-JR-MA-048-044                  | 41.882           | 0.526            | 20.081                         | 3.711                          | 21.472 | 4.856 | 0.298 | 6.790  | 0.037             | 0.000            | 99.654  |
| 03-JR-MA-050-009                  | 41.544           | 0.789            | 19.769                         | 3.651                          | 20.573 | 5.372 | 0.278 | 7.469  | 0.059             | 0.000            | 99.504  |
| 03-JR-MA-052-013                  | 42.211           | 0.572            | 22.892                         | 0.173                          | 20.595 | 4.266 | 0.381 | 9.485  | 0.074             | 0.000            | 100.649 |
| 03-JR-MA-052-014                  | 40.393           | 1.166            | 20.745                         | 1.571                          | 20.139 | 5.189 | 0.313 | 9.481  | 0.069             | 0.000            | 99.067  |
| 03-JR-MA-052-015                  | 40.953           | 0.962            | 21.391                         | 0.987                          | 19.633 | 4.768 | 0.332 | 10.164 | 0.076             | 0.000            | 99.267  |
| 03-JR-MA-052-016                  | 40.889           | 0.774            | 19.852                         | 3.521                          | 21.088 | 5.170 | 0.312 | 7.614  | 0.065             | 0.000            | 99.285  |
| 03-JR-MA-052-019                  | 41.161           | 0.491            | 18.563                         | 6.015                          | 20.256 | 5.400 | 0.411 | 7.400  | 0.057             | 0.000            | 99.753  |
| 03-JR-MA-052-023                  | 41.498           | 0.702            | 19.791                         | 4.498                          | 20.933 | 5.329 | 0.292 | 6.863  | 0.053             | 0.001            | 99.958  |
| 03-JR-MA-054-034                  | 41.359           | 0.827            | 21.628                         | 0.678                          | 19.226 | 4.496 | 0.376 | 11.054 | 0.087             | 0.000            | 99.731  |
| 03-JR-MA-054-035                  | 40.708           | 0.796            | 21.780                         | 0.733                          | 19.602 | 4.409 | 0.360 | 11.182 | 0.083             | 0.001            | 99.659  |

# Appendix E. Chromites

| Sample                 | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO    | MnO    | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------------|------------------|------------------|--------------------------------|--------------------------------|--------|--------|--------|--------|-------------------|------------------|---------|
| 03-JR-MA-054-036       | 41.538           | 0.696            | 20.435                         | 2.782                          | 21.123 | 5.090  | 0.276  | 7.813  | 0.050             | 0.000            | 99.803  |
| 03-JR-MA-054-037       | 40.854           | 1.048            | 20.791                         | 1.598                          | 20.202 | 5.007  | 0.324  | 8.939  | 0.082             | 0.000            | 98.843  |
| 03-JR-MA-056-042       | 41.655           | 0.752            | 21.570                         | 0.734                          | 19.951 | 4.527  | 0.344  | 9.993  | 0.082             | 0.002            | 99.609  |
| 03-JR-MA-058-023       | 41.016           | 1.128            | 20.932                         | 0.383                          | 19.254 | 4.499  | 0.307  | 11.607 | 0.102             | 0.002            | 99.229  |
| 03-JR-MA-075-015       | 41.576           | 0.733            | 21.431                         | 1.200                          | 19.809 | 4.531  | 0.355  | 10.040 | 0.083             | 0.000            | 99.758  |
| 03-JR-MA-096-003       | 41.925           | 0.598            | 21.414                         | 1.797                          | 21.654 | 4.472  | 0.255  | 7.870  | 0.061             | 0.000            | 100.045 |
| 03-JR-MA-151-002       | 41.894           | 0.744            | 22.203                         | 0.276                          | 21.203 | 4.271  | 0.253  | 8.967  | 0.058             | 0.000            | 99.868  |
| 03-JR-MA-170-001       | 40.720           | 0.880            | 20.998                         | 2.059                          | 21.381 | 4.673  | 0.261  | 8.066  | 0.062             | 0.007            | 99.105  |
| 03-JR-MA-193-002       | 41.771           | 0.747            | 21.003                         | 2.765                          | 21.530 | 4.743  | 0.283  | 7.127  | 0.052             | 0.000            | 100.020 |
| 03-JR-MA-197-001       | 41.588           | 0.527            | 20.020                         | 3.894                          | 20.691 | 5.144  | 0.298  | 7.588  | 0.041             | 0.000            | 99.789  |
| 03-JR-MA-240-002       | 41.248           | 0.486            | 19.040                         | 5.545                          | 20.064 | 5.159  | 0.356  | 7.898  | 0.060             | 0.002            | 99.856  |
| 03-JR-MA-251-003       | 42.201           | 0.526            | 20.978                         | 3.092                          | 21.165 | 4.781  | 0.347  | 7.226  | 0.054             | 0.001            | 100.372 |
| 03-JR-MA-292-007       | 40.805           | 0.696            | 16.545                         | 8.300                          | 19.226 | 6.305  | 0.305  | 8.183  | 0.043             | 0.000            | 100.407 |
| 03-JR-MA-294-005       | 41.876           | 0.508            | 19.593                         | 5.186                          | 20.932 | 5.842  | 0.270  | 6.101  | 0.037             | 0.000            | 100.345 |
| 03-JR-MA-309-014       | 41.226           | 0.524            | 22.368                         | 0.044                          | 18.614 | 4.640  | 0.408  | 12.445 | 0.046             | 0.000            | 100.315 |
| 03-JR-MA-317-053       | 41.891           | 0.571            | 20.550                         | 3.003                          | 21.455 | 4.906  | 0.273  | 7.157  | 0.046             | 0.000            | 99.853  |
| 03-JR-SG-001-003       | 42.070           | 0.621            | 20.296                         | 3.169                          | 21.378 | 4.891  | 0.292  | 7.378  | 0.058             | 0.003            | 100.157 |
| 03-JR-SG-005-005       | 41.537           | 0.591            | 20.769                         | 2.545                          | 20.709 | 4.945  | 0.315  | 8.232  | 0.043             | 0.004            | 99.689  |
| 03-JR-SG-010-015       | 41.356           | 0.832            | 20.627                         | 2.591                          | 20.347 | 4.954  | 0.332  | 9.210  | 0.064             | 0.000            | 100.311 |
| 03-JR-SG-012-008       | 41.311           | 0.860            | 20.683                         | 2.354                          | 20.928 | 4.975  | 0.250  | 8.241  | 0.062             | 0.000            | 99.664  |
| <b>CRUSTAL GARNETS</b> |                  |                  |                                |                                |        |        |        |        |                   |                  |         |
| 03-JR-BD-008-050       | 34.403           | 0.084            | 0.206                          | 0.573                          | 0.130  | 33.269 | 0.011  | 27.136 | 0.000             | 0.001            | 95.812  |
| 03-JR-BD-008-051       | 39.005           | 0.213            | 20.331                         | 0.000                          | 0.086  | 33.276 | 0.701  | 5.894  | 0.000             | 0.000            | 99.505  |
| 03-JR-BD-008-052       | 38.664           | 0.163            | 19.063                         | 0.000                          | 0.064  | 33.096 | 0.884  | 7.112  | 0.007             | 0.000            | 99.051  |
| 03-JR-MA-006-001       | 38.266           | 0.094            | 21.550                         | 0.069                          | 8.681  | 5.930  | 0.543  | 24.205 | 0.009             | 0.000            | 99.347  |
| 03-JR-MA-006-002       | 37.781           | 0.016            | 20.897                         | 0.056                          | 4.810  | 7.787  | 1.712  | 26.239 | 0.000             | 0.000            | 99.297  |
| 03-JR-MA-006-003       | 38.467           | 0.075            | 21.562                         | 0.005                          | 7.773  | 6.893  | 0.730  | 24.248 | 0.000             | 0.003            | 99.755  |
| 03-JR-MA-006-147       | 39.461           | 0.022            | 22.161                         | 0.027                          | 10.793 | 6.565  | 0.660  | 20.185 | 0.000             | 0.000            | 99.875  |
| 03-JR-MA-006-148       | 38.887           | 0.067            | 21.439                         | 0.072                          | 9.107  | 6.096  | 0.586  | 23.117 | 0.004             | 0.003            | 99.379  |
| 03-JR-MA-008-001       | 37.295           | 0.275            | 20.072                         | 0.012                          | 0.487  | 12.602 | 4.265  | 24.620 | 0.000             | 0.001            | 99.628  |
| 03-JR-MA-010-011       | 35.075           | 0.141            | 19.837                         | 0.002                          | 1.321  | 1.240  | 25.795 | 14.798 | 0.017             | 0.000            | 98.225  |
| 03-JR-MA-013-001       | 38.563           | 0.125            | 21.243                         | 0.044                          | 7.654  | 6.751  | 0.432  | 24.802 | 0.006             | 0.000            | 99.621  |
| 03-JR-MA-014-001       | 36.773           | 0.101            | 20.448                         | 0.000                          | 1.288  | 11.190 | 2.819  | 26.406 | 0.000             | 0.000            | 99.026  |
| 03-JR-MA-020-005       | 39.417           | 0.032            | 22.783                         | 0.016                          | 11.390 | 8.086  | 0.383  | 17.621 | 0.000             | 0.000            | 99.727  |
| 03-JR-MA-024-001       | 38.500           | 0.065            | 21.889                         | 0.184                          | 9.321  | 4.018  | 0.580  | 25.153 | 0.000             | 0.000            | 99.711  |
| 03-JR-MA-024-002       | 38.548           | 0.168            | 21.547                         | 0.000                          | 7.579  | 6.367  | 0.561  | 24.760 | 0.000             | 0.000            | 99.530  |
| 03-JR-MA-042-001       | 34.945           | 0.184            | 1.270                          | 1.836                          | 0.181  | 33.143 | 0.027  | 23.981 | 0.000             | 0.000            | 95.566  |

Appendix E. Chromites

| Sample           | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO    | MnO    | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------|------------------|------------------|--------------------------------|--------------------------------|--------|--------|--------|--------|-------------------|------------------|---------|
| 03-JR-MA-045-001 | 37.647           | 0.102            | 21.436                         | 0.012                          | 5.382  | 8.031  | 0.918  | 25.639 | 0.004             | 0.000            | 99.170  |
| 03-JR-MA-045-008 | 38.906           | 0.077            | 21.799                         | 0.032                          | 9.777  | 5.715  | 0.597  | 22.750 | 0.009             | 0.009            | 99.669  |
| 03-JR-MA-045-009 | 38.252           | 0.202            | 20.548                         | 0.003                          | 0.141  | 34.629 | 0.272  | 4.385  | 0.000             | 0.000            | 98.431  |
| 03-JR-MA-048-001 | 38.218           | 0.011            | 21.397                         | 0.066                          | 8.107  | 3.990  | 0.381  | 27.120 | 0.000             | 0.001            | 99.291  |
| 03-JR-MA-048-002 | 38.488           | 0.043            | 20.996                         | 0.076                          | 6.947  | 6.348  | 1.084  | 25.388 | 0.000             | 0.000            | 99.370  |
| 03-JR-MA-048-003 | 34.727           | 0.009            | 0.634                          | 0.026                          | 0.018  | 32.296 | 0.238  | 28.066 | 0.000             | 0.000            | 96.015  |
| 03-JR-MA-048-045 | 37.954           | 0.128            | 17.052                         | 0.017                          | 0.098  | 34.132 | 0.984  | 7.911  | 0.013             | 0.002            | 98.292  |
| 03-JR-MA-050-001 | 38.086           | 0.113            | 21.083                         | 0.035                          | 6.928  | 6.525  | 0.779  | 26.078 | 0.000             | 0.000            | 99.626  |
| 03-JR-MA-054-001 | 37.036           | 0.103            | 20.411                         | 0.015                          | 0.794  | 13.822 | 11.436 | 15.880 | 0.000             | 0.000            | 99.497  |
| 03-JR-MA-054-002 | 37.675           | 0.106            | 21.274                         | 0.040                          | 6.243  | 6.671  | 0.740  | 26.754 | 0.000             | 0.008            | 99.510  |
| 03-JR-MA-054-003 | 38.196           | 0.114            | 21.850                         | 0.054                          | 9.676  | 6.722  | 0.566  | 21.879 | 0.007             | 0.001            | 99.065  |
| 03-JR-MA-054-004 | 38.307           | 0.029            | 21.594                         | 0.123                          | 8.248  | 5.604  | 0.745  | 24.795 | 0.000             | 0.000            | 99.444  |
| 03-JR-MA-054-005 | 37.771           | 0.141            | 21.081                         | 0.035                          | 6.215  | 6.701  | 0.865  | 26.572 | 0.000             | 0.000            | 99.380  |
| 03-JR-MA-054-033 | 40.461           | 0.061            | 22.999                         | 0.197                          | 16.632 | 4.296  | 0.359  | 14.767 | 0.023             | 0.004            | 99.798  |
| 03-JR-MA-054-038 | 39.365           | 0.002            | 22.264                         | 0.041                          | 11.900 | 5.692  | 0.372  | 19.887 | 0.000             | 0.001            | 99.523  |
| 03-JR-MA-054-053 | 37.886           | 0.057            | 17.390                         | 0.003                          | 0.399  | 30.935 | 3.391  | 8.761  | 0.001             | 0.000            | 98.823  |
| 03-JR-MA-054-054 | 38.008           | 0.075            | 21.210                         | 0.000                          | 6.971  | 6.013  | 1.134  | 25.905 | 0.002             | 0.000            | 99.318  |
| 03-JR-MA-054-068 | 36.455           | 0.013            | 20.717                         | 0.008                          | 1.661  | 0.584  | 10.113 | 29.980 | 0.000             | 0.000            | 99.532  |
| 03-JR-MA-056-001 | 34.705           | 0.029            | 0.105                          | 0.000                          | 0.047  | 31.996 | 0.150  | 28.736 | 0.000             | 0.000            | 95.767  |
| 03-JR-MA-056-002 | 34.792           | 0.000            | 1.141                          | 0.000                          | 0.000  | 32.797 | 0.032  | 26.765 | 0.000             | 0.004            | 95.530  |
| 03-JR-MA-063-001 | 34.905           | 0.006            | 0.120                          | 0.003                          | 0.103  | 33.126 | 0.053  | 27.589 | 0.000             | 0.000            | 95.904  |
| 03-JR-MA-063-071 | 35.333           | 0.104            | 19.685                         | 0.000                          | 0.125  | 0.624  | 28.496 | 14.532 | 0.000             | 0.000            | 98.898  |
| 03-JR-MA-075-017 | 36.931           | 0.009            | 10.374                         | 0.000                          | 0.014  | 33.704 | 0.627  | 15.892 | 0.009             | 0.000            | 97.560  |
| 03-JR-MA-077-011 | 38.726           | 0.175            | 18.385                         | 0.019                          | 0.042  | 34.595 | 0.179  | 6.796  | 0.000             | 0.001            | 98.917  |
| 03-JR-MA-081-033 | 38.069           | 0.075            | 16.847                         | 0.000                          | 0.076  | 31.418 | 2.305  | 9.937  | 0.000             | 0.000            | 98.725  |
| 03-JR-MA-081-034 | 37.810           | 0.706            | 17.995                         | 0.004                          | 0.075  | 34.910 | 0.489  | 6.071  | 0.000             | 0.000            | 98.059  |
| 03-JR-MA-081-039 | 33.650           | 1.990            | 2.608                          | 0.048                          | 0.185  | 31.590 | 0.692  | 24.955 | 0.027             | 0.005            | 95.749  |
| 03-JR-MA-091-001 | 38.312           | 0.036            | 21.924                         | 0.067                          | 10.003 | 1.387  | 0.537  | 27.169 | 0.000             | 0.000            | 99.434  |
| 03-JR-MA-091-002 | 38.598           | 0.089            | 21.720                         | 0.148                          | 8.666  | 5.312  | 0.501  | 24.750 | 0.000             | 0.000            | 99.782  |
| 03-JR-MA-096-001 | 39.118           | 0.073            | 22.069                         | 0.096                          | 10.034 | 6.196  | 0.678  | 21.789 | 0.007             | 0.000            | 100.058 |
| 03-JR-MA-096-038 | 36.726           | 0.009            | 20.791                         | 0.013                          | 2.302  | 1.322  | 4.780  | 34.437 | 0.000             | 0.000            | 100.380 |
| 03-JR-MA-096-039 | 36.505           | 0.482            | 16.589                         | 0.000                          | 0.100  | 32.317 | 1.247  | 10.011 | 0.000             | 0.002            | 97.253  |
| 03-JR-MA-096-041 | 36.735           | 0.479            | 15.052                         | 6.589                          | 0.097  | 33.961 | 0.354  | 4.450  | 0.000             | 0.000            | 97.716  |
| 03-JR-MA-104-002 | 38.506           | 0.019            | 21.590                         | 0.053                          | 8.344  | 1.163  | 1.864  | 28.775 | 0.000             | 0.002            | 100.314 |
| 03-JR-MA-104-003 | 37.053           | 0.477            | 14.033                         | 0.011                          | 0.112  | 34.314 | 0.394  | 11.107 | 0.000             | 0.000            | 97.501  |
| 03-JR-MA-110-003 | 34.063           | 0.106            | 0.705                          | 0.027                          | 0.094  | 33.400 | 0.021  | 26.816 | 0.000             | 0.000            | 95.231  |
| 03-JR-MA-110-009 | 39.456           | 0.040            | 21.986                         | 0.043                          | 10.464 | 6.329  | 0.544  | 21.321 | 0.000             | 0.009            | 100.192 |
| 03-JR-MA-110-103 | 39.159           | 0.157            | 18.840                         | 0.011                          | 0.219  | 34.632 | 0.254  | 6.435  | 0.000             | 0.001            | 99.707  |



# Appendix E. Chromites

| Sample           | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO    | MnO    | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------|------------------|------------------|--------------------------------|--------------------------------|--------|--------|--------|--------|-------------------|------------------|---------|
| 03-JR-MA-110-107 | 34 752           | 0 249            | 1 030                          | 0 000                          | 0 263  | 33 192 | 0 035  | 26 212 | 0 000             | 0 000            | 95 733  |
| 03-JR-MA-124-001 | 40 349           | 0 075            | 22 610                         | 0 058                          | 13 904 | 6 734  | 0 512  | 15 778 | 0 000             | 0 000            | 100 021 |
| 03-JR-MA-124-002 | 37 667           | 0 036            | 21 402                         | 0 038                          | 5 404  | 8 516  | 1 395  | 25 264 | 0 000             | 0 010            | 99 731  |
| 03-JR-MA-124-003 | 37 513           | 0 065            | 20 991                         | 0 019                          | 4 309  | 7 487  | 1 156  | 28 094 | 0 000             | 0 000            | 99 634  |
| 03-JR-MA-137-019 | 35 217           | 0 014            | 0 732                          | 0 000                          | 0 177  | 33 249 | 0 032  | 26 603 | 0 000             | 0 000            | 96 025  |
| 03-JR-MA-137-020 | 34 793           | 0 000            | 0 351                          | 0 000                          | 0 139  | 33 121 | 0 023  | 27 498 | 0 000             | 0 000            | 95 924  |
| 03-JR-MA-140-002 | 36 592           | 0 006            | 21 085                         | 0 012                          | 2 673  | 0 520  | 2 266  | 37 100 | 0 000             | 0 000            | 100 253 |
| 03-JR-MA-142-044 | 37 959           | 0 137            | 19 178                         | 0 000                          | 0 053  | 29 417 | 3 259  | 8 833  | 0 000             | 0 000            | 98 835  |
| 03-JR-MA-144-132 | 35 365           | 0 041            | 1 376                          | 0 000                          | 0 270  | 33 575 | 0 018  | 26 185 | 0 000             | 0 000            | 96 829  |
| 03-JR-MA-144-133 | 35 357           | 0 000            | 0 089                          | 0 014                          | 0 130  | 33 100 | 0 007  | 27 791 | 0 000             | 0 000            | 96 488  |
| 03-JR-MA-149-065 | 34 909           | 0 000            | 21 008                         | 0 095                          | 3 004  | 0 723  | 2 159  | 36 009 | 0 000             | 0 000            | 97 906  |
| 03-JR-MA-154-034 | 39 204           | 0 041            | 21 913                         | 0 012                          | 10 245 | 5 691  | 0 596  | 22 218 | 0 000             | 0 000            | 99 919  |
| 03-JR-MA-181-027 | 38 083           | 0 440            | 15 001                         | 0 001                          | 0 103  | 34 155 | 0 512  | 10 323 | 0 000             | 0 003            | 98 620  |
| 03-JR-MA-181-028 | 38 421           | 0 069            | 18 493                         | 0 002                          | 0 193  | 34 259 | 0 612  | 6 944  | 0 005             | 0 000            | 98 999  |
| 03-JR-MA-193-033 | 38 783           | 0 024            | 17 249                         | 0 004                          | 0 109  | 34 369 | 1 037  | 7 715  | 0 000             | 0 000            | 99 290  |
| 03-JR-MA-218-073 | 36 505           | 0 304            | 11 310                         | 11 338                         | 0 109  | 31 835 | 0 631  | 6 239  | 0 000             | 0 000            | 98 271  |
| 03-JR-MA-239-038 | 38 471           | 0 044            | 21 481                         | 0 000                          | 7 485  | 5 781  | 0 753  | 26 037 | 0 000             | 0 000            | 100 050 |
| 03-JR-MA-240-014 | 33 802           | 4 312            | 1 797                          | 0 003                          | 0 375  | 32 412 | 0 244  | 23 452 | 0 104             | 0 000            | 96 501  |
| 03-JR-MA-240-022 | 38 728           | 0 047            | 21 928                         | 0 012                          | 8 997  | 6 394  | 0 571  | 23 169 | 0 000             | 0 000            | 99 845  |
| 03-JR-MA-240-075 | 38 372           | 0 132            | 21 669                         | 0 023                          | 9 250  | 6 399  | 0 391  | 23 543 | 0 004             | 0 000            | 99 782  |
| 03-JR-MA-240-076 | 38 534           | 0 051            | 21 527                         | 0 041                          | 7 255  | 6 907  | 0 419  | 25 562 | 0 004             | 0 000            | 100 299 |
| 03-JR-MA-240-077 | 36 784           | 0 212            | 20 828                         | 0 058                          | 1 322  | 10 010 | 8 640  | 21 459 | 0 000             | 0 000            | 99 312  |
| 03-JR-MA-240-078 | 38 530           | 0 315            | 16 766                         | 0 009                          | 0 139  | 34 276 | 0 314  | 8 871  | 0 000             | 0 002            | 99 221  |
| 03-JR-MA-240-079 | 38 501           | 0 151            | 21 162                         | 0 030                          | 6 928  | 6 214  | 0 539  | 26 855 | 0 000             | 0 000            | 100 380 |
| 03-JR-MA-240-080 | 35 266           | 0 080            | 1 228                          | 2 273                          | 0 051  | 33 094 | 0 029  | 24 352 | 0 000             | 0 001            | 96 373  |
| 03-JR-MA-241-043 | 37 409           | 0 252            | 10 685                         | 11 051                         | 0 101  | 32 683 | 0 730  | 5 953  | 0 004             | 0 000            | 98 868  |
| 03-JR-MA-251-006 | 39 302           | 0 080            | 22 091                         | 0 059                          | 9 570  | 6 886  | 0 569  | 22 036 | 0 000             | 0 003            | 100 596 |
| 03-JR-MA-251-007 | 39 992           | 0 029            | 22 360                         | 0 001                          | 10 343 | 8 381  | 0 449  | 19 206 | 0 000             | 0 000            | 100 761 |
| 03-JR-MA-251-091 | 39 317           | 0 020            | 21 996                         | 0 129                          | 11 774 | 2 947  | 0 443  | 23 362 | 0 003             | 0 000            | 99 990  |
| 03-JR-MA-251-092 | 38 890           | 0 000            | 21 598                         | 0 093                          | 9 073  | 4 040  | 0 561  | 26 059 | 0 000             | 0 000            | 100 313 |
| 03-JR-MA-251-093 | 37 953           | 0 187            | 20 708                         | 0 017                          | 4 063  | 9 066  | 2 118  | 25 757 | 0 015             | 0 000            | 99 884  |
| 03-JR-MA-251-094 | 37 164           | 0 000            | 21 109                         | 0 024                          | 4 516  | 0 993  | 1 713  | 34 313 | 0 000             | 0 000            | 99 831  |
| 03-JR-MA-254-071 | 36 557           | 0 021            | 20 855                         | 0 012                          | 2 820  | 0 118  | 11 928 | 27 764 | 0 000             | 0 000            | 100 074 |
| 03-JR-MA-254-072 | 39 628           | 0 060            | 22 200                         | 0 139                          | 12 644 | 2 971  | 0 355  | 21 918 | 0 000             | 0 001            | 99 915  |
| 03-JR-MA-273-003 | 37 461           | 0 487            | 12 903                         | 9 848                          | 0 217  | 33 152 | 0 127  | 4 118  | 0 002             | 0 001            | 98 315  |
| 03-JR-MA-288-046 | 34 511           | 0 195            | 0 558                          | 3 719                          | 0 167  | 33 124 | 0 016  | 23 689 | 0 000             | 0 000            | 95 979  |
| 03-JR-MA-292-034 | 39 957           | 0 045            | 22 543                         | 0 015                          | 12 897 | 5 505  | 0 419  | 18 885 | 0 000             | 0 001            | 100 267 |
| 03-JR-MA-309-089 | 39 779           | 0 043            | 22 441                         | 0 069                          | 11 889 | 5 724  | 0 436  | 19 742 | 0 009             | 0 000            | 100 132 |

# Appendix E. Chromites

| Sample           | SiO <sub>2</sub> | TiO <sub>2</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | MgO    | CaO    | MnO   | FeO    | Na <sub>2</sub> O | K <sub>2</sub> O | Total   |
|------------------|------------------|------------------|--------------------------------|--------------------------------|--------|--------|-------|--------|-------------------|------------------|---------|
| 03-JR-MA-309-090 | 38.693           | 0.033            | 21.251                         | 0.000                          | 6.248  | 8.715  | 0.586 | 24.512 | 0.000             | 0.000            | 100.038 |
| 03-JR-MA-309-091 | 38.589           | 0.082            | 21.338                         | 0.000                          | 5.405  | 10.877 | 0.608 | 23.047 | 0.000             | 0.001            | 99.946  |
| 03-JR-MA-312-002 | 34.850           | 0.201            | 1.326                          | 2.784                          | 0.960  | 32.231 | 0.012 | 22.827 | 0.000             | 0.007            | 95.199  |
| 03-JR-MA-317-068 | 38.182           | 0.609            | 15.771                         | 4.930                          | 0.091  | 32.982 | 1.089 | 5.437  | 0.007             | 0.000            | 99.097  |
| 03-JR-MA-317-069 | 38.196           | 0.528            | 16.005                         | 4.674                          | 0.085  | 32.912 | 1.141 | 5.299  | 0.000             | 0.000            | 98.840  |
| 03-JR-MA-317-070 | 36.870           | 0.237            | 8.556                          | 15.064                         | 0.074  | 33.055 | 0.477 | 5.077  | 0.000             | 0.001            | 99.410  |
| 03-JR-MA-317-071 | 38.064           | 0.422            | 14.892                         | 6.098                          | 0.085  | 32.584 | 1.152 | 5.509  | 0.000             | 0.000            | 98.807  |
| 03-JR-SG-001-057 | 38.763           | 0.065            | 21.780                         | 0.081                          | 9.563  | 3.081  | 0.392 | 26.444 | 0.000             | 0.000            | 100.180 |
| 03-JR-SG-011-004 | 39.042           | 0.080            | 21.674                         | 0.037                          | 9.253  | 6.057  | 0.902 | 23.486 | 0.000             | 0.000            | 100.530 |
| 03-JR-SG-011-005 | 34.694           | 0.156            | 0.339                          | 0.245                          | 0.260  | 33.105 | 0.000 | 27.060 | 0.000             | 0.000            | 95.865  |
| 03-JR-SG-015-002 | 39.097           | 0.028            | 22.108                         | 0.065                          | 10.166 | 6.055  | 0.609 | 21.992 | 0.000             | 0.000            | 100.120 |
| 03-JR-SG-015-003 | 39.065           | 0.036            | 21.821                         | 0.052                          | 10.200 | 6.407  | 0.526 | 21.683 | 0.000             | 0.004            | 99.793  |
| 03-JR-SG-015-066 | 38.249           | 0.051            | 21.351                         | 0.014                          | 8.111  | 6.301  | 0.628 | 24.733 | 0.000             | 0.004            | 99.443  |
| 03-JR-SG-015-067 | 37.682           | 0.393            | 21.380                         | 0.132                          | 6.889  | 7.076  | 0.567 | 25.332 | 0.000             | 0.000            | 99.450  |
| 03-JR-SG-015-068 | 38.598           | 0.093            | 21.538                         | 0.119                          | 8.009  | 6.146  | 0.802 | 24.758 | 0.000             | 0.001            | 100.063 |
| 03-JR-SG-016-073 | 35.860           | 0.011            | 15.918                         | 0.195                          | 3.018  | 35.083 | 0.034 | 3.730  | 0.000             | 0.003            | 93.853  |
| 03-JR-SG-021-003 | 35.171           | 0.000            | 0.512                          | 0.187                          | 0.066  | 33.035 | 0.018 | 27.187 | 0.000             | 0.001            | 96.176  |
| 03-JR-SG-021-015 | 37.867           | 0.048            | 21.537                         | 0.022                          | 5.805  | 6.314  | 1.351 | 27.070 | 0.000             | 0.002            | 100.015 |
| 03-JR-SG-021-016 | 39.022           | 0.086            | 21.420                         | 0.048                          | 8.605  | 6.239  | 0.562 | 24.037 | 0.000             | 0.000            | 100.019 |
| 03-JR-TM-004-043 | 36.709           | 0.011            | 20.838                         | 0.018                          | 2.706  | 1.347  | 3.770 | 34.592 | 0.000             | 0.000            | 99.991  |
| 03-JR-TM-004-044 | 37.022           | 0.002            | 20.965                         | 0.000                          | 3.536  | 1.024  | 1.613 | 36.108 | 0.000             | 0.000            | 100.270 |

| Sample                                  | SiO <sub>2</sub> | TiO <sub>2</sub> | Nb <sub>2</sub> O <sub>5</sub> | Al <sub>2</sub> O <sub>3</sub> | Cr <sub>2</sub> O <sub>3</sub> | V <sub>2</sub> O <sub>5</sub> | MgO    | MnO   | FeO*   | NiO   | ZnO   | Total  | FeO    | Total   |
|-----------------------------------------|------------------|------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|--------|-------|--------|-------|-------|--------|--------|---------|
| DIAMOND INCLUSION AND INTERGROWTH FIELD |                  |                  |                                |                                |                                |                               |        |       |        |       |       |        |        |         |
| 03-JR-MA-024-010                        | 0.081            | 0.324            | 0.000                          | 8.364                          | 62.288                         | 0.035                         | 16.318 | 0.187 | 11.379 | 0.193 | 0.052 | 99.221 | 8.265  | 99.568  |
| 03-JR-MA-075-008                        | 0.077            | 0.315            | 0.002                          | 6.399                          | 62.080                         | 0.037                         | 14.996 | 0.181 | 14.437 | 0.204 | 0.048 | 98.776 | 9.855  | 99.286  |
| 03-JR-MA-167-006                        | 0.125            | 0.147            | 0.029                          | 6.372                          | 62.264                         | 0.083                         | 11.331 | 0.620 | 18.501 | 0.193 | 0.029 | 99.695 | 15.324 | 100.048 |
| 03-JR-MA-167-020                        | 0.100            | 0.094            | 0.031                          | 5.820                          | 64.644                         | 0.025                         | 14.870 | 0.252 | 13.309 | 0.167 | 0.036 | 99.346 | 9.933  | 99.724  |
| 03-JR-SG-010-018                        | 0.051            | 0.177            | 0.014                          | 7.660                          | 63.863                         | 0.032                         | 16.774 | 0.165 | 10.231 | 0.185 | 0.014 | 99.167 | 7.337  | 99.488  |



## Appendix I

### METAMORPHIC/MAGMATIC MASSIVE SULPHIDE INDICATOR MINERAL (MMSIM) PICKING RESULTS

#### Summary List of Abbreviations

(abbreviation of elements same as in Appendix E)

|     |              |
|-----|--------------|
| Cpy | Chalcopyrite |
| Py  | Pyrite       |
| Gth | Goethite     |
| Ky  | Kyanite      |
| Sil | Sillimanite  |
| St  | Staurolite   |
| Sps | Spessartine  |

|      |               |
|------|---------------|
| Fay  | Fayalite      |
| Opx  | Orthopyroxene |
| Cr   | Chromite      |
| Tr   | trace         |
| gr   | grains(s)     |
| Moly | Molybdenite   |
| amp  | amperes       |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                     |           |       |   |                                          |                                                            |              |      |       | Mg/Mn/Al/Cr Minerals |       |       |       |      |                        |  |  |  |  |
|---------------|--------------------------------------|---------------------|-----------|-------|---|------------------------------------------|------------------------------------------------------------|--------------|------|-------|----------------------|-------|-------|-------|------|------------------------|--|--|--|--|
|               | 0.25-0.5 mm                          |                     |           |       |   |                                          |                                                            |              |      |       | 0.25-0.5 mm          |       |       |       |      |                        |  |  |  |  |
|               | >1.0 amp                             |                     |           |       |   | <1.0 amp                                 |                                                            |              |      |       | >1.0 amp             |       |       |       |      | >0.8 amp               |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSiMs  | % Py      | % Gth |   | # Grains + Colour Spinel                 | Misc. Prime MMSiMs                                         | % Red Rutile | % Ky | % Sil | % St                 | % Sps | % Fay | % Opx | % Cr |                        |  |  |  |  |
| 03-JR-MA-001  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | Tr   | Tr    | 0                    | 0     | 0.5   | 0     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-002  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | Tr low-Cr diopside (1 gr)                                  | 0            | 0    | Tr    | Tr                   | 0     | 0     | 7     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-003  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | Tr sapphirine corundum (1 gr)<br>Tr low-Cr diopside (1 gr) | 0            | Tr   | Tr    | Tr                   | 0     | 0     | 1     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-004  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | 0    | Tr    | Tr                   | 0     | 0     | 1     | Tr   | (1 gr. see KIM data)   |  |  |  |  |
| 03-JR-MA-005  | 0                                    | 0                   | 0         | Tr    | 0 | 0                                        | 0                                                          | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-006  | Tr (1 gr)                            | 0                   | Tr (3 gr) | 0     | 0 | 4 blue-green garnet, 2 blue-green spinel | Tr low-Cr diopside (23 gr)                                 | Tr (3 gr)    | Tr   | 1     | 0                    | 0     | 0     | Tr    | Tr   | (~500 gr see KIM data) |  |  |  |  |
| 03-JR-MA-007  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | 0    | Tr    | Tr                   | 0     | 0     | 10    | Tr   | (1 gr. see KIM data)   |  |  |  |  |
| 03-JR-MA-008  | 0                                    | Tr malachite (4 gr) | 0         | 0     | 0 | 0                                        | Tr low-Cr diopside (3 gr)                                  | 0            | 0    | Tr    | Tr                   | 0     | Tr    | 7     | Tr   | (1 gr. see KIM data)   |  |  |  |  |
| 03-JR-MA-009  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-010  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | 0    | Tr    | Tr                   | Tr    | 0     | 1     | Tr   | (6 gr. see KIM data)   |  |  |  |  |
| 03-JR-MA-011  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | 0    | 0     | Tr                   | 0     | 0     | 0     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-012  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | 0                                                          | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0    | 0                      |  |  |  |  |
| 03-JR-MA-013  | 0                                    | 0                   | 0         | 0     | 0 | 0                                        | Tr low-Cr diopside (3 gr)                                  | 0            | 0    | Tr    | 1                    | 0     | 0     | 20    | Tr   | (1 gr. see KIM data)   |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                     |           |       |                                          |                                                          |           |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                            |          |                            |  |  |  |  |
|---------------|--------------------------------------|---------------------|-----------|-------|------------------------------------------|----------------------------------------------------------|-----------|------|-------|------|----------------------|-------|-------|----------------------------|----------|----------------------------|--|--|--|--|
|               | 0.25-0.5 mm                          |                     |           |       |                                          |                                                          |           |      |       |      | 0.25-0.5 mm          |       |       |                            |          |                            |  |  |  |  |
|               | >1.0 amp                             |                     |           |       |                                          | <1.0 amp                                                 |           |      |       |      | >1.0 amp             |       |       |                            |          | >0.8 amp                   |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSiMs  | % Py      | % Gth | # Grains + Colour Spinel                 | Misc. Prime MMSiMs                                       | % Rutile  | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                       | >1.0 amp | Prime Carbonatite Minerals |  |  |  |  |
| 03-JR-MA-001  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | Tr   | Tr    | 0    | 0                    | 0.5   | 0     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-002  | 0                                    | 0                   | 0         | 0     | 0                                        | Tr low-Cr diopside (1 gr)                                | 0         | 0    | Tr    | Tr   | 0                    | 0     | 7     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-003  | 0                                    | 0                   | 0         | 0     | 0                                        | Tr sapphire corundum (1 gr)<br>Tr low-Cr diopside (1 gr) | 0         | Tr   | Tr    | Tr   | 0                    | 0     | 1     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-004  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | 0    | Tr    | 0    | 0                    | 0     | 1     | Tr (1 gr, see KIM data)    | 0        |                            |  |  |  |  |
| 03-JR-MA-005  | 0                                    | 0                   | 0         | Tr    | 0                                        | 0                                                        | 0         | 0    | 0     | 0    | 0                    | 0     | 0     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-006  | Tr (1 gr)                            | 0                   | Tr (3 gr) | 0     | 4 blue-green gahnic; 2 blue-green spinel | Tr low-Cr diopside (23 gr)                               | Tr (3 gr) | Tr   | Tr    | 1    | 0                    | 0     | Tr    | Tr (~500 gr, see KIM data) | 0        |                            |  |  |  |  |
| 03-JR-MA-007  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | 0    | Tr    | 0    | 0                    | 0     | 10    | Tr (1 gr, see KIM data)    | 0        |                            |  |  |  |  |
| 03-JR-MA-008  | 0                                    | Tr malachite (4 gr) | 0         | 0     | 0                                        | Tr low-Cr diopside (3 gr)                                | 0         | 0    | Tr    | Tr   | 0                    | Tr    | 7     | Tr (1 gr, see KIM data)    | 0        |                            |  |  |  |  |
| 03-JR-MA-009  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | 0    | 0     | 0    | 0                    | 0     | 0     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-010  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | Tr   | Tr    | Tr   | 0                    | 0     | 1     | Tr (6 gr, see KIM data)    | 0        |                            |  |  |  |  |
| 03-JR-MA-011  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | 0    | Tr    | 0    | 0                    | 0     | 0     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-012  | 0                                    | 0                   | 0         | 0     | 0                                        | 0                                                        | 0         | 0    | 0     | 0    | 0                    | 0     | 0     | 0                          | 0        |                            |  |  |  |  |
| 03-JR-MA-013  | 0                                    | 0                   | 0         | 0     | 0                                        | Tr low-Cr diopside (3 gr)                                | 0         | Tr   | 1     | 0    | 0                    | 0     | 20    | Tr (1 gr, see KIM data)    | 0        |                            |  |  |  |  |

## Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |            |       | Mg/Mn/Al/Cr Minerals |                    |      |       |                            |                    |              |      |       |      |       |          |       |                             |                          |          |  |  |  |          |
|---------------|--------------------------------------|--------------------|------------|-------|----------------------|--------------------|------|-------|----------------------------|--------------------|--------------|------|-------|------|-------|----------|-------|-----------------------------|--------------------------|----------|--|--|--|----------|
|               | 0.25-0.5 mm                          |                    |            |       | 0.25-0.5 mm          |                    |      |       |                            |                    |              |      |       |      |       |          |       |                             |                          |          |  |  |  |          |
|               | >1.0 amp                             |                    |            |       | <1.0 amp             |                    |      |       | >1.0 amp                   |                    |              |      |       |      |       | >0.8 amp |       |                             |                          | <0.8 amp |  |  |  | >1.0 amp |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py       | % Gth | % Cpy                | Misc. Prime MMSIMs | % Py | % Gth | # Grains + Colour Spinel   | Misc. Prime MMSIMs | % Red Rutile | % Ky | % Sil | % St | % Sps | % Fay    | % Opx | % Cr                        | Prime Carbonate Minerals |          |  |  |  |          |
| 03-JR-MA-014  | 0                                    | 0                  | 0          | 0     | 0                    | 0                  | 0    | 0     | Tr low-Cr diopside (12 gr) | 0                  | 0            | 0    | 0     | Tr   | 0     | Tr       | 10    | Tr (7 gr, see KIM data)     | 0                        |          |  |  |  |          |
| 03-JR-MA-015  | 0                                    | 0                  | 0          | 0     | 0                    | 0                  | 0    | 0     | 0                          | 0                  | 0            | 0    | 0     | Tr   | 0     | 0        | 4     | Tr (22 gr, see KIM data)    | 0                        |          |  |  |  |          |
| 03-JR-MA-016  | 0                                    | 0                  | 0          | 0     | 0                    | 0                  | 0    | 0     | Tr low-Cr diopside (8 gr)  | 0                  | 0            | 0    | 0     | Tr   | 0     | 0        | 5     | Tr (11 gr, see KIM data)    | 0                        |          |  |  |  |          |
| 03-JR-MA-017  | 0                                    | 0                  | 0          | 0     | 0                    | 0                  | 0    | 0     | 0                          | 0                  | 0            | Tr   | 0     | Tr   | 0     | 0        | 2     | 0                           | 0                        |          |  |  |  |          |
| 03-JR-MA-018  | 0                                    | 0                  | 0.5 (5 gr) | 0     | 0                    | 0                  | 0    | 0     | 0                          | 0                  | 0            | 0    | 0     | Tr   | 0     | 0        | 0     | 0.3 (2 gr, see KIM data)    | 0                        |          |  |  |  |          |
| 03-JR-MA-019  | 0                                    | 0                  | 0          | 0     | 0                    | 0                  | 0    | 0     | 0                          | 0                  | 0            | 0    | 0     | Tr   | 0     | 0        | 0     | Tr (1 gr, see KIM data)     | 0                        |          |  |  |  |          |
| 03-JR-MA-020  | 0                                    | 0                  | 0          | 0     | 0                    | 0                  | 0    | 0     | Tr low-Cr diopside (3 gr)  | 0                  | 0            | 0    | Tr    | Tr   | 0     | 0        | 5     | Tr (2 gr, see KIM data)     | 0                        |          |  |  |  |          |
| 03-JR-MA-021  | Tr (1 gr)                            | 0                  | Tr (5 gr)  | 0     | 0                    | 0                  | 0    | 0     | Tr low-Cr diopside (8 gr)  | Tr (1 gr)          | 0            | 0    | 0     | 0    | Tr    | 0        | 5     | Tr (22 gr, see KIM data)    | 0                        |          |  |  |  |          |
| 03-JR-MA-022  | 0                                    | 0                  | Tr (2 gr)  | Tr    | 0                    | 0                  | Tr   | 0     | Tr low-Cr diopside (4 gr)  | 0                  | 0            | Tr   | 0     | Tr   | 0     | 0        | 7     | Tr (~100 gr, see KIM data)  | 0                        |          |  |  |  |          |
| 03-JR-MA-023  | 0                                    | 0                  | 0          | 1     | 0                    | 0                  | 0    | 0     | Tr low-Cr diopside (5 gr)  | 0                  | 0            | 0    | 0     | 0    | 0     | 0        | Tr    | Tr (2 gr, see KIM data)     | 0                        |          |  |  |  |          |
| 03-JR-MA-024  | 0                                    | Tr Moly (1 gr)     | Tr (3 gr)  | 0     | 0                    | 0                  | 0    | 0     | Tr low-Cr diopside (5 gr)  | 0                  | 0            | 0    | Tr    | 1    | 0     | 0        | 3     | 0.5 (~800 gr, see KIM data) | 0                        |          |  |  |  |          |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                                          |              |       |                                         |          |          |                            |                          |                    | Mg/Mn/Al/Cr Minerals |      |       |       |                            |                           |                          |          |  |  |  |  |  |  |          |
|---------------|--------------------------------------|------------------------------------------|--------------|-------|-----------------------------------------|----------|----------|----------------------------|--------------------------|--------------------|----------------------|------|-------|-------|----------------------------|---------------------------|--------------------------|----------|--|--|--|--|--|--|----------|
|               | 0.25-0.5 mm                          |                                          |              |       |                                         |          |          |                            |                          |                    | 0.25-0.5 mm          |      |       |       |                            |                           |                          |          |  |  |  |  |  |  |          |
|               | >1.0 amp                             |                                          |              |       |                                         | <1.0 amp |          |                            |                          |                    | >1.0 amp             |      |       |       |                            |                           |                          | <0.8 amp |  |  |  |  |  |  | >1.0 amp |
|               | % Cpy                                | Misc. Prime MMSIMs                       | % Py         | % Gth |                                         | % Ky     | % Rutile | % MMSIMs                   | # Grains + Colour Spinel | Misc. Prime MMSIMs | % Sil                | % St | % Sps | % Fay | % Opx                      | % Cr                      | Prime Carbonate Minerals |          |  |  |  |  |  |  |          |
| 03-JR-MA-025  | Tr (1 gr)                            | 0                                        | Tr (5 gr)    | Tr    | 1 blue-green garnet; 2 pale blue spinel | Tr       | 0        | Tr low-Cr diopside (17 gr) | 0                        | Tr                 | Tr                   | 0    | 0     | 3     | 1 (~5000 gr. see KIM data) | 0                         |                          |          |  |  |  |  |  |  |          |
| 03-JR-MA-026  | 0                                    | 0                                        | 0            | 0     | 0                                       | Tr       | 0        | Tr low-Cr diopside (5 gr)  | 0                        | Tr                 | Tr                   | 0    | 0     | 2     | Tr (2 gr. see KIM data)    | 0                         |                          |          |  |  |  |  |  |  |          |
| 03-JR-MA-027  | Tr (4 gr)                            | 30 barite (~10000 gr) Tr fluorite (1 gr) | 0.1 (~30 gr) | 0     | 0                                       | Tr       | 0        | Tr low-Cr diopside (11 gr) | 0                        | Tr                 | Tr                   | 0    | 0     | 3     | Tr (13 gr. see KIM data)   | 0                         |                          |          |  |  |  |  |  |  |          |
| 03-JR-MA-028  | 0                                    | 0                                        | Tr (5 gr)    | Tr    | 0                                       | Tr       | 0        | Tr low-Cr diopside (1 gr)  | 0                        | Tr                 | Tr                   | Tr   | 0     | 2     | 0.5 (~70 gr. see KIM data) | 0                         |                          |          |  |  |  |  |  |  |          |
| 03-JR-MA-029  | 0                                    | 0                                        | 0            | Tr    | 0                                       | 0        | 0        | Tr low-Cr diopside (4 gr)  | 0                        | Tr                 | Tr                   | Tr   | 0     | 0     | Tr                         | 1 (~200 gr. see KIM data) | 0                        |          |  |  |  |  |  |  |          |
| 03-JR-MA-030  | 0                                    | 0                                        | 0            | 0     | 0                                       | Tr       | 0        | Tr low-Cr diopside (2 gr)  | 0                        | Tr                 | 0                    | 0.5  | 0     | 0     | Tr (19 gr. see KIM data)   | 0                         |                          |          |  |  |  |  |  |  |          |
| 03-JR-MA-031  | 0                                    | 0                                        | 0            | 0     | 0                                       | Tr       | 0        | Tr low-Cr diopside (1 gr)  | 0                        | Tr                 | Tr                   | 0    | Tr    | 0     | Tr (~60 gr. see KIM data)  | 0                         |                          |          |  |  |  |  |  |  |          |
| 03-JR-MA-032  | 0.5 (9 gr)                           | 0                                        | Tr (1 gr)    | 0     | 0                                       | 0        | 0        | 0                          | 0                        | 0                  | 0                    | 0    | 0     | 0     | 0                          | 0                         | 0                        |          |  |  |  |  |  |  |          |



Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |              |       |                          |                            |              |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                             |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|--------------|-------|--------------------------|----------------------------|--------------|------|-------|------|----------------------|-------|-------|-----------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |              |       |                          |                            |              |      |       |      | 0.25-0.5 mm          |       |       |                             |                          |          |  |  |  |  |
|               | >1.0 amp                             |                    |              |       |                          | >1.0 amp                   |              |      |       |      | >0.8 amp             |       |       |                             |                          | <0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py         | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs         | % Red Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                        | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-MA-033  | 0                                    | 0                  | Tr (1 gr)    | 0     | 0                        | Tr low-Cr diopside (5 gr)  | 0            | 0    | Tr    | 0.5  | 0                    | 0     | 1     | 0.3 (~120 gr. see KIM data) | 0                        |          |  |  |  |  |
| 03-JR-MA-034  | 0                                    | 0                  | Tr (5 gr)    | 0     | 0                        | Tr low-Cr diopside (3 gr)  | 0            | 0    | Tr    | Tr   | 0                    | 0     | 2     | 0                           | 0                        |          |  |  |  |  |
| 03-JR-MA-035  | 0                                    | 0                  | 40 (~200 gr) | 0     | 0                        | 0                          | 0            | 0    | 0     | 0    | 0                    | 0     | 0     | 0                           | 0                        |          |  |  |  |  |
| 03-JR-MA-036  | 0                                    | 0                  | 0            | 0     | 0                        | Tr low-Cr diopside (14 gr) | 0            | Tr   | Tr    | Tr   | 0                    | 0     | 25    | Tr (3 gr. see KIM data)     | 0                        |          |  |  |  |  |
| 03-JR-MA-037  | 0                                    | 0                  | 0            | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0            | 0    | 0     | 0    | 0                    | 0     | 0.5   | 0.5 (1 gr. see KIM data)    | 0                        |          |  |  |  |  |
| 03-JR-MA-038  | 0                                    | 0                  | Tr (1 gr)    | 0     | 0                        | Tr low-Cr diopside (5 gr)  | 0            | Tr   | 0     | Tr   | 0                    | 15    | 1     | Tr (16 gr. see KIM data)    | 0                        |          |  |  |  |  |
| 03-JR-MA-039  | 0                                    | 0                  | 0            | 1     | 0                        | 0                          | 0            | 0    | 0     | 0    | 0                    | 0     | 0     | 0                           | 0                        |          |  |  |  |  |
| 03-JR-MA-040  | 0                                    | 0                  | Tr (2 gr)    | 3     | 0                        | Tr low-Cr diopside (1 gr)  | 0            | 0    | Tr    | 0    | 0                    | 0     | 1     | 3 gr. see KIM data)         | 0                        |          |  |  |  |  |
| 03-JR-MA-041  | Tr (1 gr)                            | 0                  | 0            | Tr    | 0                        | Tr low-Cr diopside (3 gr)  | 0            | 0    | Tr    | Tr   | 0                    | Tr    | 2     | 1.5 (~100 gr. see KIM data) | 0                        |          |  |  |  |  |

## Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |             |       |                                          |                                                                                 |          |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                             |                          |          |  |  |  |  |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|-------------|-------|------------------------------------------|---------------------------------------------------------------------------------|----------|------|-------|------|----------------------|-------|-------|-----------------------------|--------------------------|----------|--|--|--|--|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |             |       |                                          |                                                                                 |          |      |       |      | 0.25-0.5 mm          |       |       |                             |                          |          |  |  |  |  |          |  |  |  |  |
|               | >1.0 amp                             |                    |             |       |                                          | <1.0 amp                                                                        |          |      |       |      | >1.0 amp             |       |       |                             |                          | <0.8 amp |  |  |  |  | >1.0 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSiMs | Py          | % Gth | # Grains + Colour Spinel                 | Misc. Prime MMSiMs                                                              | % Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                        | Prime Carbonate Minerals |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-042  | Tr (2 gr)                            | 0                  | Tr (~10 gr) | 0     | 0                                        | Tr sapphirine (1 gr)<br>Tr<br>Cr-andradite (1 gr)<br>Tr low-Cr diopside (26 gr) | 0        | Tr   | Tr    | 2    | 0                    | 0.5   | 0.5   | Tr (~50 gr; see KIM data)   | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-043  | 0                                    | 0                  | 0           | 0     | 1 blue-green gahnite; 1 pale grey spinel | Tr Mn-epidote (1 gr)<br>Tr<br>corundum (1 gr)<br>Tr low-Cr diopside (12 gr)     | 0        | 0    | Tr    | Tr   | 0                    | 0     | 2     | 0.5 (~300 gr; see KIM data) | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-044  | 0                                    | 0                  | 0           | 0     | 0                                        | Tr Cr-grossular (1 gr)<br>Tr low-Cr diopside (6 gr)                             | 0        | 0    | Tr    | Tr   | 0                    | 0     | 1     | Tr (~100 gr; see KIM data)  | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-045  | 0                                    | 0                  | 0           | 0     | 0                                        | Tr low-Cr diopside (10 gr)                                                      | 0        | 0    | Tr    | Tr   | 0                    | 0     | 2     | Tr (5 gr; see KIM data)     | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-046  | 0                                    | 0                  | Tr (1 gr)   | 0     | 0                                        | Tr low-Cr diopside (1 gr)                                                       | 0        | 0    | Tr    | Tr   | 0                    | 0     | 0     | 0                           | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-047  | 0                                    | 0                  | 0           | 0     | 0                                        | Tr low-Cr diopside (3 gr)                                                       | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (~50 gr; see KIM data)   | 0                        |          |  |  |  |  |          |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |                |       |                          |                            |          |      |       |      | Mg/Mn/AU/Cr Minerals |       |       |                          |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|----------------|-------|--------------------------|----------------------------|----------|------|-------|------|----------------------|-------|-------|--------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |                |       |                          |                            |          |      |       |      | 0.25-0.5 mm          |       |       |                          |                          |          |  |  |  |  |
|               | >1.0 amp                             |                    |                |       |                          | <1.0 amp                   |          |      |       |      | >1.0 amp             |       |       |                          |                          | >0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py           | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs         | % Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                     | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-MA-048  | Tr (18 gr)                           | 0                  | 0.25 (~150 gr) | Tr    | 1 pale blue              | Tr low-Cr diopside (10 gr) | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (9 gr. see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-049  | 0                                    | 0                  | 0              | 0     | 0                        | 0                          | 0        | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                        | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-050  | 0                                    | 0                  | Tr (3 gr)      | Tr    | 0                        | Tr low-Cr diopside (5 gr)  | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (2 gr. see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-051  | 0                                    | 0                  | 0              | 0     | 0                        | 0                          | 0        | 0    | Tr    | Tr   | 0                    | 0     | 0     | 0                        | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-052  | 0                                    | 0                  | Tr (1 gr)      | 0     | 0                        | Tr low-Cr diopside (26 gr) | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (7 gr. see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-053  | 0                                    | 0                  | 0              | 0     | 0                        | 0                          | 0        | 0    | 0     | 0.5  | 0                    | 0     | Tr    | 0                        | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-054  | Tr (1 gr)                            | 0                  | Tr (~150 gr)   | Tr    | 0                        | Tr low-Cr diopside (11 gr) | 0        | 0    | Tr    | 1    | 0                    | 0     | Tr    | Tr (17 gr. see KIM data) | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-055  | Tr (4 gr)                            | 0                  | 2 (~800 gr)    | Tr    | 0                        | Tr low-Cr diopside (6 gr)  | 0        | 0    | Tr    | Tr   | 0                    | 0     | 2     | Tr (8 gr. see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-056  | Tr (36 gr)                           | 0                  | 4 (~1000 gr)   | 0     | 0                        | Tr low-Cr diopside (3 gr)  | 0        | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                        | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-057  | 0                                    | 0                  | 0              | 0     | 0                        | 0                          | 0        | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                        | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-058  | Tr (1 gr)                            | 0                  | Tr (2 gr)      | 0     | 0                        | Tr low-Cr diopside (3 gr)  | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (17 gr. see KIM data) | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-059  | 0                                    | 0                  | 0              | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0        | 0    | Tr    | 0.5  | 0                    | 0     | 10    | 0                        | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-060  | Tr (1 gr)                            | 0                  | 0              | Tr    | 0                        | 0                          | 0        | 0    | 0     | Tr   | Tr                   | 0     | Tr    | Tr (40 gr. see KIM data) | 0                        | >1.0 amp |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |            |          |                          |                                                    |          |      |       |      |                          |
|---------------|--------------------------------------|--------------------|------------|----------|--------------------------|----------------------------------------------------|----------|------|-------|------|--------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |            |          |                          | 0.25-0.5 mm                                        |          |      |       |      |                          |
|               | >1.0 amp                             |                    |            | <1.0 amp |                          | >1.0 amp                                           |          |      |       |      |                          |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py       | % Gth    | # Grains + Colour Spinel | Misc. Prime MMSIMs                                 | % Rutile | % Ky | % Sil | % St | >0.8 amp                 |
| 03-JR-MA-061  | 0                                    | 0                  | 0          | 0        | 0                        | Tr low-Cr diopside (6 gr)                          | 0        | 0    | Tr    | 0    | Tr (3 gr. see KIM data)  |
| 03-JR-MA-062  | 0                                    | 0                  | 0          | 0        | 0                        |                                                    | 0        | 0    | Tr    | 0    | 0                        |
| 03-JR-MA-063  | 0                                    | 0                  | 0          | 0        | 0                        | Tr vesuvianite (1 gr)<br>Tr low-Cr diopside (3 gr) | 0        | 0    | Tr    | 2    | Tr (61 gr. see KIM data) |
| 03-JR-MA-064  | 0                                    | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | 0     | 0    | 0                        |
| 03-JR-MA-065  | 0                                    | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | 0     | 0    | 0                        |
| 03-JR-MA-066  | 0                                    | 0                  | Tr (2 gr)  | 0        | 0                        | Tr low-Cr diopside (5 gr)                          | 0        | 0    | Tr    | Tr   | Tr (1 gr. see KIM data)  |
| 03-JR-MA-067  | 0                                    | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | Tr    | 0    | 0                        |
| 03-JR-MA-068  | 0                                    | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | 0     | 0    | 0                        |
| 03-JR-MA-069  | 0                                    | 0                  | Tr (10 gr) | 0        | 0                        | Tr low-Cr diopside (1 gr)                          | 0        | 0    | 0     | 0    | Tr (1 gr. see KIM data)  |
| 03-JR-MA-070  | 0                                    | 0                  | 0          | Tr       | 0                        | Tr low-Cr diopside (2 gr)                          | 0        | 0    | Tr    | 0    | Tr (7 gr. see KIM data)  |
| 03-JR-MA-071  | 0                                    | 0                  | 0          | 0        | 0                        | Tr low-Cr diopside (1 gr)                          | 0        | 0    | Tr    | 0    | 0                        |
| 03-JR-MA-072  | 0                                    | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | Tr    | 0    | 0                        |
| 03-JR-MA-073  | Tr (1 gr)                            | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | 0     | 0    | 0                        |
| 03-JR-MA-074  | 0                                    | 0                  | 0          | 0        | 0                        | 0                                                  | 0        | 0    | 0     | 0    | 0                        |
| 03-JR-MA-075  | 0                                    | 0                  | 0          | 0        | 0                        | Tr low-Cr diopside (6 gr)                          | 0        | 0    | Tr    | Tr   | Tr (11 gr. see KIM data) |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |             |          |                          | Mg/Mn/Al/Cr Minerals      |              |      |       |      |          |       |                           |          |  |  |  |          |
|---------------|--------------------------------------|--------------------|-------------|----------|--------------------------|---------------------------|--------------|------|-------|------|----------|-------|---------------------------|----------|--|--|--|----------|
|               | 0.25-0.5 mm                          |                    |             |          |                          | 0.25-0.5 mm               |              |      |       |      |          |       |                           |          |  |  |  |          |
|               | >1.0 amp                             |                    |             | <1.0 amp |                          | >1.0 amp                  |              |      |       |      | >0.8 amp |       |                           | <0.8 amp |  |  |  | >1.0 amp |
|               | % Cpy                                | Misc. Prime MMSiMs | % Py        | % Gth    | # Grains + Colour Spinel | Misc. Prime MMSiMs        | % Red Rutile | % Ky | % Sil | % St | % Fay    | % Opx | % Cr                      |          |  |  |  |          |
| 03-JR-MA-076  | Tr (1 gr)                            | 0                  | Tr (~15 gr) | Tr       | 0                        | Tr low-Cr diopside (6 gr) | 0            | 0    | Tr    | 1    | Tr       | 3     | Tr (7 gr, see KIM data)   | 0        |  |  |  |          |
| 03-JR-MA-077  | 0                                    | 0                  | Tr (1 gr)   | Tr       | 0                        | Tr low-Cr diopside (7 gr) | 0            | 0    | Tr    | Tr   | 0        | Tr    | Tr (9 gr, see KIM data)   | 0        |  |  |  |          |
| 03-JR-MA-078  | 0                                    | 0                  | 0           | Tr       | 0                        | Tr low-Cr diopside (4 gr) | 0            | 0    | Tr    | Tr   | 0        | Tr    | Tr (5 gr, see KIM data)   | 0        |  |  |  |          |
| 03-JR-MA-079  | 0                                    | 0                  | 0           | 0        | 0                        | Tr low-Cr diopside (6 gr) | 0            | 0    | 0     | Tr   | 0        | Tr    | Tr (5 gr, see KIM data)   | 0        |  |  |  |          |
| 03-JR-MA-080  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 1     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-081  | Tr (3 gr)                            | 0                  | Tr (5 gr)   | 0        | 0                        | Tr low-Cr diopside (4 gr) | 0            | Tr   | 0     | 2    | 0        | Tr    | Tr (~50 gr, see KIM data) | 0        |  |  |  |          |
| 03-JR-MA-082  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-083  | 0                                    | 0                  | 0           | 0        | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | 0     | Tr   | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-084  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 1    | 0        | 0     | Tr (7 gr, see KIM data)   | 0        |  |  |  |          |
| 03-JR-MA-085  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-086  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-087  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-088  | 0                                    | 0                  | Tr (1 gr)   | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-089  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | 0                         | 0        |  |  |  |          |
| 03-JR-MA-090  | 0                                    | 0                  | 0           | 0        | 0                        | 0                         | 0            | 0    | 0     | 0    | 0        | 0     | Tr (6 gr, see KIM data)   | 0        |  |  |  |          |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                                                                                                             |           |          |                          |                                                   |             |      |       |          |                          |
|---------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------|----------|--------------------------|---------------------------------------------------|-------------|------|-------|----------|--------------------------|
|               | Sulphide/Arsenide + Related Minerals |                                                                                                             |           |          |                          |                                                   | 0.25-0.5 mm |      |       |          |                          |
|               | >1.0 amp                             |                                                                                                             |           | <1.0 amp |                          |                                                   | >1.0 amp    |      |       | >0.8 amp |                          |
|               | % Cpy                                | Misc. Prime MMSIMs                                                                                          | % Py      | % Gth    | # Grains + Colour Spinel | Misc. Prime MMSIMs                                | % Rutile    | % Ky | % Sil | % St     | Prime Carbonate Minerals |
| 03-JR-MA-091  | 0                                    | 0                                                                                                           | 0         | 0        | 0                        | Tr low-Cr diopside (2 gr)                         | 0           | 0    | 0     | 0.5      | 0                        |
| 03-JR-MA-092  | Tr (5 gr)                            | Tr native silver (~125 gr)<br>Tr native copper (1 gr)<br>Tr freibergite (1 gr)<br>2% loellingite (~1000 gr) | 0         | 0        | 0                        | 0                                                 | 0           | 0    | 0     | 0        | 0                        |
| 03-JR-MA-093  | 0                                    | 0                                                                                                           | 0         | 0        | 0                        | 0                                                 | 0           | 0    | 0     | Tr       | 0                        |
| 03-JR-MA-094  | 0                                    | 0                                                                                                           | 0         | 0        | 0                        | Tr low-Cr diopside (3 gr)                         | 0           | 0    | 0     | 0        | 0                        |
| 03-JR-MA-095  | 0                                    | 0                                                                                                           | 0         | Tr       | 0                        | 0                                                 | 0           | 0    | Tr    | Tr       | 0                        |
| 03-JR-MA-096  | 0                                    | 0                                                                                                           | Tr (2 gr) | 0        | 1 pale blue              | Tr grossular (1 gr)<br>Tr low-Cr diopside (14 gr) | 0           | Tr   | 0     | Tr       | 0                        |
| 03-JR-MA-097  | 0                                    | 0                                                                                                           | 0         | 0        | 0                        | Tr low-Cr diopside (1 gr)                         | 0           | 0    | 0     | Tr       | 0                        |
| 03-JR-MA-098  | 0                                    | 0                                                                                                           | 0         | Tr       | 0                        | 0                                                 | 0           | Tr   | Tr    | Tr       | 0                        |



Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |             |       |  |                          |                           |              |      |       |
|---------------|--------------------------------------|--------------------|-------------|-------|--|--------------------------|---------------------------|--------------|------|-------|
|               | Sulphide/Arsenide + Related Minerals |                    |             |       |  | 0.25-0.5 mm              |                           |              |      |       |
|               | >1.0 amp                             |                    |             |       |  | >1.0 amp                 |                           |              |      |       |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py        | % Gth |  | # Grains + Colour Spinel | Misc. Prime MMSIMs        | % Red Rutile | % Ky | % Sil |
| 03-JR-MA-099  | 0                                    | 0                  | 0           | 0     |  | 0                        | 0                         | 0            | 0    | 0     |
| 03-JR-MA-100  | 0                                    | 0                  | 0           | 0     |  | 0                        | Tr low-Cr diopside (3 gr) | 0            | Tr   | 0.5   |
| 03-JR-MA-101  | Tr (1 gr)                            | 0                  | Tr (1 gr)   | 0     |  | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | Tr    |
| 03-JR-MA-102  | 0                                    | 0                  | 0           | Tr    |  | 0                        | Tr low-Cr diopside (5 gr) | 0            | 0    | Tr    |
| 03-JR-MA-103  | 0                                    | 0                  | 0           | 0     |  | 0                        | 0                         | 0            | 0    | Tr    |
| 03-JR-MA-104  | 0                                    | 0                  | Tr (~10 gr) | Tr    |  | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | Tr    |
| 03-JR-MA-105  | 0                                    | 0                  | Tr (1 gr)   | 0     |  | 0                        | 0                         | 0            | 0    | 0     |
| 03-JR-MA-106  | 0                                    | 0                  | 0.5 (~5 gr) | Tr    |  | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | 0     |
| 03-JR-MA-107  | 0                                    | 0                  | 0           | 0     |  | 0                        | 0                         | 0            | 0    | 0     |
| 03-JR-MA-108  | 0                                    | 0                  | 0           | 0     |  | 1 pale blue              | Tr low-Cr diopside (2 gr) | 0            | 0    | 0     |
| 03-JR-MA-109  | 0                                    | 0                  | 0           | 0     |  | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | 0     |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |             |       |  |                               |                                                      |              |      |       | Mg/Mn/AU/Cr Minerals |       |       |       |                            |          |       |       |       |                          |
|---------------|--------------------------------------|--------------------|-------------|-------|--|-------------------------------|------------------------------------------------------|--------------|------|-------|----------------------|-------|-------|-------|----------------------------|----------|-------|-------|-------|--------------------------|
|               | 0.25-0.5 mm                          |                    |             |       |  |                               |                                                      |              |      |       | 0.25-0.5 mm          |       |       |       |                            |          |       |       |       |                          |
|               | >1.0 amp                             |                    |             |       |  | <1.0 amp                      |                                                      |              |      |       | >1.0 amp             |       |       |       |                            | >0.8 amp |       |       |       |                          |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py        | % Gth |  | # Grains + Colour Spinel      | Misc. Prime MMSIMs                                   | % Red Rutile | % Ky | % Sil | % St                 | % Sps | % Fay | % Opx | % Cr                       |          | % Sps | % Fay | % Opx | % Cr                     |
| 03-JR-MA-110  | Tr (19 gr)                           | 0                  | Tr (~25 gr) | 0     |  | 2 green garnet; 1 grey spinel | Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (5 gr) | 0            | Tr   | Tr    | Tr                   | 0     | 0     | Tr    | Tr (~300 gr, see KIM data) |          | 0     | 0     | Tr    | 0                        |
| 03-JR-MA-111  | 0                                    | 0                  | 0           | 0     |  | 0                             | 0                                                    | 0            | 0    | 0     | 0                    | 0     | 0     | Tr    | 0                          |          | 0     | 0     | Tr    | 0                        |
| 03-JR-MA-112  | 0                                    | 0                  | 0           | 0     |  | 0                             | Mn-epidote (1 gr)<br>Tr low-Cr diopside (9 gr)       | 0            | Tr   | Tr    | Tr                   | 0     | 0     | 2     | Tr (22 gr, see KIM data)   |          | 0     | 0     | 2     | Tr (22 gr, see KIM data) |
| 03-JR-MA-113  | 0                                    | 0                  | 1 (1 gr)    | 0     |  | 0                             | 0                                                    | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0                          |          | 0     | 0     | 0     | 0                        |
| 03-JR-MA-114  | 0                                    | 0                  | 0           | 0     |  | 0                             | 0                                                    | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0                          |          | 0     | 0     | 0     | 0                        |
| 03-JR-MA-115  | 0                                    | 0                  | 2 (~200 gr) | 0     |  | 0                             | 0                                                    | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0                          |          | 0     | 0     | 0     | 0                        |
| 03-JR-MA-116  | 0                                    | 0                  | 0           | 0     |  | 0                             | Tr low-Cr diopside (3 gr)                            | 0            | Tr   | 0     | Tr                   | 0     | 0     | 4     | Tr (7 gr, see KIM data)    |          | 0     | 0     | 4     | Tr (7 gr, see KIM data)  |
| 03-JR-MA-117  | 0                                    | 0                  | 0           | 0     |  | 0                             | 0                                                    | 0            | 0    | 0     | 0                    | 0     | 0     | 0     | 0                          |          | 0     | 0     | 0     | 0                        |
| 03-JR-MA-118  | 0                                    | 0                  | 0           | 0     |  | 0                             | Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (1 gr) | 0            | Tr   | 0     | Tr                   | 0     | 0     | 0     | Tr (1 gr, see KIM data)    |          | 0     | 0     | 0     | 0                        |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |            |       |                          |                                                  |              |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                           |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|------------|-------|--------------------------|--------------------------------------------------|--------------|------|-------|------|----------------------|-------|-------|---------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |            |       |                          | >1.0 amp                                         |              |      |       |      | >0.8 amp             |       |       |                           |                          | <0.8 amp |  |  |  |  |
|               | >1.0 amp                             |                    |            |       |                          | <1.0 amp                                         |              |      |       |      | >0.8 amp             |       |       |                           |                          | <0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py       | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs                               | % Red Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                      | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-MA-119  | 0                                    | 0                  | 0          | 0     | 1 grey                   | Cr-grossular (2 gr)<br>Tr low-Cr diopside (6 gr) | 0            | 0    | 0     | Tr   | 0                    | 0     | 15    | Tr (1 gr; see KIM data)   | 0                        |          |  |  |  |  |
| 03-JR-MA-120  | 0                                    | 0                  | 0          | 0     | 0                        | 0                                                | 0            | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |
| 03-JR-MA-121  | 0                                    | 0                  | 0          | 0     | 0                        | Tr low-Cr diopside (2 gr)                        | 0            | 0    | 0     | 0    | 0                    | 0     | Tr    | 0                         | 0                        |          |  |  |  |  |
| 03-JR-MA-122  | 0                                    | 0                  | 0          | 0     | 0                        | Tr low-Cr diopside (1 gr)                        | 0            | 0    | 0     | 0.5  | 0                    | 0     | 0     | Tr (19 gr; see KIM data)  | 0                        |          |  |  |  |  |
| 03-JR-MA-123  | 0                                    | 0                  | Tr (1 gr)  | 0     | 0                        | Tr low-Cr diopside (1 gr)                        | 0            | Tr   | 0     | Tr   | 0                    | 0     | Tr    | Tr (13 gr; see KIM data)  | 0                        |          |  |  |  |  |
| 03-JR-MA-124  | 0                                    | 0                  | 0          | 0     | 0                        | 0                                                | 0            | Tr   | Tr    | Tr   | 0                    | 0     | Tr    | 0                         | 0                        |          |  |  |  |  |
| 03-JR-MA-125  | 0                                    | 0                  | 0          | 0     | 0                        | 0                                                | 0            | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |
| 03-JR-MA-126  | 0                                    | 0                  | Tr (1 gr)  | 0     | 0                        | Tr low-Cr diopside (3 gr)                        | 0            | 0    | 0     | Tr   | 0                    | Tr    | Tr    | Tr (16 gr; see KIM data)  | 0                        |          |  |  |  |  |
| 03-JR-MA-127  | 0                                    | 0                  | Tr (1 gr)  | 0     | 0                        | Tr low-Cr diopside (1 gr)                        | 0            | 0    | 0     | 0    | 0                    | 0     | Tr    | 0                         | 0                        |          |  |  |  |  |
| 03-JR-MA-128  | Tr (2 gr)                            | 0                  | Tr (10 gr) | 0     | 0                        | 0                                                | 0            | 0    | 0     | Tr   | 0                    | 5     | 2     | 2 (~250 gr; see KIM data) | 0                        |          |  |  |  |  |
| 03-JR-MA-129  | 0                                    | 0                  | 0          | 0     | 0                        | 0                                                | 0            | 0    | Tr    | Tr   | 0                    | 0     | Tr    | 0                         | 0                        |          |  |  |  |  |
| 03-JR-MA-130  | Tr (1 gr)                            | 0                  | 0          | Tr    | 0                        | Tr low-Cr diopside (1 gr)                        | 0            | 0    | 0     | Tr   | 0                    | 0     | 0.5   | Tr (15 gr; see KIM data)  | 0                        |          |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |           |       |                                      |                                                                              |          |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                            |                          |          |   |   |   |   |
|---------------|--------------------------------------|--------------------|-----------|-------|--------------------------------------|------------------------------------------------------------------------------|----------|------|-------|------|----------------------|-------|-------|----------------------------|--------------------------|----------|---|---|---|---|
|               | 0.25-0.5 mm                          |                    |           |       |                                      |                                                                              |          |      |       |      | 0.25-0.5 mm          |       |       |                            |                          |          |   |   |   |   |
|               | >1.0 amp                             |                    |           |       |                                      | <1.0 amp                                                                     |          |      |       |      | >1.0 amp             |       |       |                            |                          | >0.8 amp |   |   |   |   |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth | # Grains + Colour Spinel             | Misc. Prime MMSIMs                                                           | % Rutile | % Ky | % Slt | % St | % Sps                | % Fay | % Opx | % Cr                       | Prime Carbonate Minerals | >1.0 amp |   |   |   |   |
| 03-JR-MA-131  | 0                                    | 0                  | 0         | 0     | 0                                    | 0                                                                            | 0        | 0    | Tr    | Tr   | 0                    | Tr    | 0     | Tr                         | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-132  | 0                                    | 0                  | 0         | Tr    | 0                                    | 0                                                                            | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | 0                          | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-133  | 0                                    | 0                  | 0         | 0     | 0                                    | Tr low-Cr diopside (1 gr)                                                    | 0        | 0    | 0     | Tr   | 0                    | 0     | Tr    | Tr                         | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-134  | 0                                    | 0                  | Tr (1 gr) | 0     | 0                                    | Tr low-Cr diopside (1 gr)                                                    | 0        | 0    | Tr    | 0    | 0                    | 0     | Tr    | Tr                         | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-135  | 0                                    | 0                  | 0         | 0     | 0                                    | Tr low-Cr diopside (2 gr)                                                    | 0        | 0    | 0     | Tr   | 0                    | 0     | 1     | 0                          | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-136  | 0                                    | 0                  | 0         | 0     | 0                                    | Tr low-Cr diopside (2 gr)                                                    | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | 0                          | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-137  | 0                                    | 0                  | 0         | 0     | 0                                    | Tr low-Cr diopside (4 gr)                                                    | 0        | Tr   | 0     | Tr   | 0                    | Tr    | 1     | Tr                         | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-138  | Tr (7 gr)                            | 0                  | Tr (2 gr) | 0     | 1 green garnet, 2 pale purple spinel | Tr Mn-epidote (1 gr)<br>Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (9 gr) | 0        | Tr   | Tr    | Tr   | 0                    | 0     | 0     | 2 (~7000 gr. see KIM data) | 0                        | 0        | 0 | 0 | 0 | 0 |
| 03-JR-MA-139  | 0                                    | 0                  | 0         | 0     | 0                                    | Tr low-Cr diopside (4 gr)                                                    | 0        | Tr   | Tr    | Tr   | 0                    | 0     | Tr    | Tr                         | 0                        | 0        | 0 | 0 | 0 | 0 |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |            |       |                                                 |                                                                               |              |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                              |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|------------|-------|-------------------------------------------------|-------------------------------------------------------------------------------|--------------|------|-------|------|----------------------|-------|-------|------------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |            |       |                                                 |                                                                               |              |      |       |      | 0.25-0.5 mm          |       |       |                              |                          |          |  |  |  |  |
|               | >1.0 amp                             |                    |            |       |                                                 | <1.0 amp                                                                      |              |      |       |      | >1.0 amp             |       |       |                              |                          | <0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py       | % Gth | # Grains + Colour Spinel                        | Misc. Prime MMSIMs                                                            | % Red Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                         | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-MA-140  | Tr (5 gr)                            | 0                  | Tr (10 gr) | 0     | 0                                               | Tr low-Cr diopside (7 gr)                                                     | 0            | Tr   | Tr    | Tr   | 0                    | 0     | Tr    | Tr (-400 gr; see KIM data)   | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-141  | 0                                    | 0                  | 0          | 0     | 1 blue-grey                                     | Tr Mn-epidote (1 gr)<br>Tr low-Cr diopside (12 gr)                            | 0            | Tr   | Tr    | 2    | 0                    | 0     | 6     | Tr (1 gr; see KIM data)      | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-142  | 0                                    | 0                  | 0          | 0     | 3 blue-green, grey, pale purple                 | Tr low-Cr diopside (7 gr)                                                     | 0            | Tr   | Tr    | 1    | 0                    | 0.5   | 5     | Tr (-50 gr; see KIM data)    | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-143  | 0                                    | 0                  | 0          | Tr    | 0                                               | 0                                                                             | 0            | 0    | 0     | 2    | 0                    | Tr    | 2     | Tr (7 gr; see KIM data)      | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-144  | Tr (5 gr)                            | 0                  | 0          | 0     | 2 blue-green garnite; 2 blue-green, grey spinel | Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (10 gr)                         | 0            | Tr   | Tr    | 2    | 0                    | Tr    | 2     | 0.5 (-2000 gr; see KIM data) | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-145  | 0                                    | 0                  | 0          | 0     | 0                                               | 0                                                                             | 0            | 0    | Tr    | 1    | 0                    | 0     | 2     | Tr (-70; see KIM data)       | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-146  | 0                                    | 0                  | 0          | 0     | 0                                               | Tr Mn-epidote (1 gr)<br>Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (16 gr) | 0            | 0    | Tr    | 2    | 0                    | 0     | 2     | Tr (9 gr; see KIM data)      | 0                        | >1.0 amp |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |             |       |                          |                            |              |             |       |      |       |       |       |                             |
|---------------|--------------------------------------|--------------------|-------------|-------|--------------------------|----------------------------|--------------|-------------|-------|------|-------|-------|-------|-----------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |             |       |                          |                            |              | 0.25-0.5 mm |       |      |       |       |       |                             |
|               | >1.0 amp                             |                    |             |       |                          |                            |              | >1.0 amp    |       |      |       |       |       |                             |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py        | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs         | % Red Rutile | % Ky        | % Sil | % St | % Sps | % Fay | % Opx | % Cr                        |
| 03-JR-MA-147  | 0                                    | 0                  | 0           | Tr    | 0                        | Tr low-Cr diopside (3 gr)  | 0            | 0           | 0     | Tr   | 0     | 0     | Tr    | Tr (9 gr; see KIM data)     |
| 03-JR-MA-148  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0            | 0           | Tr    | Tr   | 0     | Tr    | Tr    | Tr (~60 gr; see KIM data)   |
| 03-JR-MA-149  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (11 gr) | Tr (2 gr)    | 0           | Tr    | 1    | 0     | 0     | Tr    | 0.5 (~500 gr; see KIM data) |
| 03-JR-MA-150  | Tr (1 gr)                            | 0                  | Tr (5 gr)   | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0            | 0           | Tr    | Tr   | 0     | 0     | Tr    | Tr (18 gr; see KIM data)    |
| 03-JR-MA-151  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (18 gr) | 0            | 0           | Tr    | 1    | 0     | 0     | 1     | Tr (~70; see KIM data)      |
| 03-JR-MA-152  | 0                                    | Tr Moly (1 gr)     | Tr (1 gr)   | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0            | 0           | Tr    | Tr   | 0     | 0     | Tr    | Tr (7 gr; see KIM data)     |
| 03-JR-MA-153  | 0                                    | 0                  | 0           | 0     | 1 pale purple            | 0                          | 0            | 0           | 0     | Tr   | 0     | 0     | Tr    | Tr (4 gr; see KIM data)     |
| 03-JR-MA-154  | 0                                    | 0                  | Tr (~20 gr) | 0     | 0                        | Tr low-Cr diopside (4 gr)  | 0            | 0           | Tr    | Tr   | 0     | 0     | Tr    | Tr (~60 gr; see KIM data)   |
| 03-JR-MA-155  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (9 gr)  | 0            | 0           | Tr    | 0.5  | 0     | 0     | Tr    | Tr (1 gr; see KIM data)     |
| 03-JR-MA-156  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (2 gr)  | 0            | Tr          | Tr    | 2    | 0     | 0     | 2     | Tr (12 gr; see KIM data)    |



Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                       |               |       |   |          |   |   |   |   | Mg/Mn/AU/Cr Minerals |       |      |       |       |          |                           |   |  |  |
|---------------|--------------------------------------|-----------------------|---------------|-------|---|----------|---|---|---|---|----------------------|-------|------|-------|-------|----------|---------------------------|---|--|--|
|               | 0.25-0.5 mm                          |                       |               |       |   |          |   |   |   |   | 0.25-0.5 mm          |       |      |       |       |          |                           |   |  |  |
|               | >1.0 amp                             |                       |               |       |   | <1.0 amp |   |   |   |   | >1.0 amp             |       |      |       |       | >0.8 amp |                           |   |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs    | % Py          | % Gth |   |          |   |   |   |   | % Ky                 | % Sil | % St | % Sps | % Fay | % Opx    | % Cr                      |   |  |  |
| 03-JR-MA-157  | 0                                    | 0                     | 0             | 0     | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | Tr   | 0     | 0     | 2        | Tr (16 gr. see KIM data)  | 0 |  |  |
| 03-JR-MA-158  | 0                                    | 0                     | Tr (1 gr)     | 0     | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | Tr    | Tr   | 0     | 0     | 0        | Tr (-60 gr. see KIM data) | 0 |  |  |
| 03-JR-MA-159  | 0                                    | 0                     | 0             | 0     | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | Tr   | 0     | 0     | 0        | 0                         | 0 |  |  |
| 03-JR-MA-160  | Tr (1 gr)                            | 0                     | 0.5 (~120 gr) | 0     | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | Tr   | 0     | 0     | Tr       | Tr (30 gr. see KIM data)  | 0 |  |  |
| 03-JR-MA-161  | Tr (3 gr)                            | 0                     | 0             | Tr    | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | 0    | 0     | Tr    | Tr       | Tr (2 gr. see KIM data)   | 0 |  |  |
| 03-JR-MA-162  | 0                                    | 0                     | 0             | Tr    | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | Tr   | 0     | 0     | Tr       | Tr (-40 gr. see KIM data) | 0 |  |  |
| 03-JR-MA-163  | 5 (~350 gr)                          | Tr sphalerite (25 gr) | Tr (~50 gr)   | Tr    | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | 0    | 0     | 0     | 0        | 0                         | 0 |  |  |
| 03-JR-MA-164  | 0                                    | 0                     | 0             | Tr    | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | 0    | Tr    | 0     | 0        | 0                         | 0 |  |  |
| 03-JR-MA-165  | Tr (1 gr)                            | 0                     | 0             | 15    | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | Tr    | Tr   | Tr    | 0     | 0        | Tr (46 gr. see KIM data)  | 0 |  |  |
| 03-JR-MA-166  | 0                                    | 0                     | Tr (5 gr)     | Tr    | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | 0    | 0     | 0     | 0        | Tr (34 gr. see KIM data)  | 0 |  |  |
| 03-JR-MA-167  | Tr (4 gr)                            | 0                     | 1 (~30 gr)    | 0     | 0 | 0        | 0 | 0 | 0 | 0 | 0                    | 0     | 0    | 0     | 0     | 0        | 1 (34 gr. see KIM data)   | 0 |  |  |

| Sample Number | Sulphide/Arsenide + Related Minerals |                     |               |       |                                           |                                                      |           |      |       |      | Mg/Mn/Al/Cr Minerals |       |                             |                              |                          |          |  |  |  |  |          |  |  |  |  |
|---------------|--------------------------------------|---------------------|---------------|-------|-------------------------------------------|------------------------------------------------------|-----------|------|-------|------|----------------------|-------|-----------------------------|------------------------------|--------------------------|----------|--|--|--|--|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                     |               |       |                                           |                                                      |           |      |       |      | 0.25-0.5 mm          |       |                             |                              |                          |          |  |  |  |  |          |  |  |  |  |
|               | >1.0 amp                             |                     |               |       |                                           | <1.0 amp                                             |           |      |       |      | >1.0 amp             |       |                             |                              |                          | <0.8 amp |  |  |  |  | >1.0 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSiMs  | % Py.         | % Gth | # Grains + Colour Spinel                  | Misc. Prime MMSiMs                                   | % Rutile  | % Ky | % Sil | % St | % Sps                | % Fay | % Opx                       | % Cr                         | Prime Carbonate Minerals |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-168  | 0                                    | 0                   | 0             | Tr    | 0                                         | Tr low-Cr diopside (1 gr)                            | 0         | 0    | 0     | 0    | 0                    | 0     | 2                           | Tr (4 gr. see KIM data)      | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-169  | Tr (3 gr)                            | 0                   | Tr (~2.5 gr)  | Tr    | 2 blue-green garnite; 1 blue-green spinel | Tr low-Cr diopside (12 gr)                           | 0         | Tr   | 1     | 0    | Tr                   | Tr    | Tr                          | 0.5 (~1000 gr. see KIM data) | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-170  | 0                                    | 0                   | 0             | 0     | 0                                         | Tr low-Cr diopside (2 gr)                            | Tr        | 0    | 2     | 0    | 0                    | Tr    | Tr                          | Tr (3 gr. see KIM data)      | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-171  | 0                                    | 0                   | Tr (3 gr)     | Tr    | 3 pale blue, grey                         | Tr low-Cr diopside (5 gr)                            | 0         | Tr   | 1     | 0    | 0                    | 1     | Tr                          | Tr (~120 gr. see KIM data)   | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-172  | 0                                    | 0                   | Tr (1 gr)     | 0     | 0                                         | Tr ruby corundum (1 gr)                              | 0         | 0    | Tr    | 0    | 0                    | 0     | Tr                          | Tr (5 gr. see KIM data)      | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-173  | 0                                    | 0                   | Tr (2 gr)     | 0     | 1 pale grey                               | Tr low-Cr diopside (5 gr)                            | Tr (2 gr) | Tr   | 0.5   | 0    | 0                    | 0     | Tr                          | Tr (~300 gr. see KIM data)   | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-174  | 0.5 (29 gr)                          | Tr malachite (2 gr) | 15 (~1000 gr) | Tr    | 0                                         | Tr ruby corundum (3 gr)<br>Tr low-Cr diopside (1 gr) | Tr (1 gr) | 0    | 1     | 0    | 15                   | Tr    | 0.5 (~150 gr. see KIM data) | 0                            |                          |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-175  | 0                                    | 0                   | 0             | 0     | 0                                         | Tr low-Cr diopside (10 gr)                           | 0         | Tr   | 2     | 0    | 0                    | Tr    | Tr (17 gr. see KIM data)    | 0                            |                          |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-176  | 0                                    | 0                   | Tr (~20 gr)   | 0     | 0                                         | Tr low-Cr diopside (4 gr)                            | 0         | 0    | 0.5   | 0    | 5                    | Tr    | Tr (21 gr. see KIM data)    | 0                            |                          |          |  |  |  |  |          |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/AUCr Minerals                  |                    |           |       |                          |                                                      |              |             |       |      |       |          |       |                                |
|---------------|--------------------------------------|--------------------|-----------|-------|--------------------------|------------------------------------------------------|--------------|-------------|-------|------|-------|----------|-------|--------------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |           |       |                          |                                                      |              | 0.25-0.5 mm |       |      |       |          |       |                                |
|               | 0.25-0.5 mm                          |                    |           |       | >1.0 amp                 |                                                      |              | >1.0 amp    |       |      |       | >0.8 amp |       |                                |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs                                   | % Red Rutile | % Ky        | % Sil | % St | % Sps | % Fay    | % Opx | % Cr                           |
| 03-JR-MA-177  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (3 gr)                            | 0            | Tr          | 0     | Tr   | 0     | Tr       | 2     | Tr<br>(~60 gr. see KIM data)   |
| 03-JR-MA-178  | 0                                    | 0                  | Tr (5 gr) | 0     | 0                        | Tr low-Cr diopside (4 gr)                            | 0            | 0           | 0     | Tr   | 0     | 3        | Tr    | 0.5<br>(~200 gr. see KIM data) |
| 03-JR-MA-179  | 0                                    | 0                  | 0         | 0     | 0                        | 0                                                    | 0            | 0           | 0     | 3    | 0     | 0        | Tr    | Tr<br>(5 gr. see KIM data)     |
| 03-JR-MA-180  | 0                                    | 0                  | Tr (4 gr) | 0     | 0                        | Tr low-Cr diopside (2 gr)                            | 0            | 0           | 0     | Tr   | 0     | 25       | Tr    | Tr<br>(~80 gr. see KIM data)   |
| 03-JR-MA-181  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (2 gr)                            | 0            | Tr          | 2     | Tr   | 0     | 0        | Tr    | Tr<br>(23 gr. see KIM data)    |
| 03-JR-MA-182  | 0                                    | 0                  | 0         | 0     | 0                        | Tr ruby corundum (1 gr)                              | 0            | 0           | Tr    | Tr   | 0     | 0        | Tr    | Tr<br>(3 gr. see KIM data)     |
| 03-JR-MA-183  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (2 gr)                            | 0            | Tr          | Tr    | 0.5  | 0     | 0        | 0.5   | Tr<br>(~80 gr. see KIM data)   |
| 03-JR-MA-184  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (1 gr)                            | 0            | 0           | 0     | Tr   | 0     | 0        | Tr    | Tr<br>(2 gr. see KIM data)     |
| 03-JR-MA-185  | Tr (1 gr)                            | 0                  | Tr (5 gr) | 0     | 0                        | Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (1 gr) | 0            | Tr          | 0     | 0.5  | 0     | 0        | Tr    | 0.5<br>(~600 gr. see KIM data) |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |            |       |                          |                            |          |      |       |      | Mg/Mn/AU/Cr Minerals |       |       |                            |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|------------|-------|--------------------------|----------------------------|----------|------|-------|------|----------------------|-------|-------|----------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |            |       |                          |                            |          |      |       |      | 0.25-0.5 mm          |       |       |                            |                          |          |  |  |  |  |
|               | >1.0 amp                             |                    |            |       |                          | <1.0 amp                   |          |      |       |      | >1.0 amp             |       |       |                            |                          | >0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py       | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs         | % Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                       | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-MA-186  | 0                                    | 0                  | 0          | 0     | 0                        | 0                          | 0        | 0    | 0     | 0    | 0                    | 0     | 0     | Tr (22 gr; see KIM data)   | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-187  | 0                                    | 0                  | 0          | 0     | 0                        | 0                          | 0        | Tr   | Tr    | 0.5  | 0                    | 0     | 0     | Tr (27 gr; see KIM data)   | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-188  | 0                                    | 0                  | 0          | 0     | 0                        | 0                          | 0        | 0    | 0     | Tr   | 0                    | 0     | 0     | Tr (~125 gr; see KIM data) | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-189  | 0                                    | 0                  | 0          | 0     | 0                        | Tr low-Cr diopside (2 gr)  | 0        | 0    | Tr    | Tr   | 0                    | 0     | 0     | Tr (11 gr; see KIM data)   | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-190  | 0                                    | 0                  | Tr (2 gr)  | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0        | Tr   | 0     | Tr   | 0                    | 0     | 0     | Tr (9 gr; see KIM data)    | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-191  | 0                                    | 0                  | 0          | 0     | 0                        | Tr low-Cr diopside (2 gr)  | 0        | 0    | Tr    | 1    | 0                    | 0     | 2     | Tr (6 gr; see KIM data)    | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-192  | 0                                    | 0                  | 0          | 0     | 0                        | Tr low-Cr diopside (1 gr)  | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (~50 gr; see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-193  | Tr (4 gr)                            | 0                  | Tr (10 gr) | Tr    | 0                        | Tr low-Cr diopside (15 gr) | 0        | Tr   | 0     | Tr   | 0                    | 0     | Tr    | Tr (10 gr; see KIM data)   | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-MA-194  | Tr (2 gr)                            | 0                  | 0          | 0     | 0                        | 0                          | 0        | 0    | Tr    | Tr   | 0                    | 30    | 0     | Tr (17 gr; see KIM data)   | 0                        | >1.0 amp |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |           |       |                          |                                                       |          |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                            |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|-----------|-------|--------------------------|-------------------------------------------------------|----------|------|-------|------|----------------------|-------|-------|----------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |           |       |                          |                                                       |          |      |       |      | 0.25-0.5 mm          |       |       |                            |                          |          |  |  |  |  |
|               | >1.0 amp                             |                    |           |       |                          | <1.0 amp                                              |          |      |       |      | >1.0 amp             |       |       |                            |                          | >0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs                                    | % Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                       | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-MA-195  | 0                                    | 0                  | 0         | 0     | 0                        | Tr ruby corundum (1 gr)<br>Tr low-Cr diopside (22 gr) | 0        | 0    | 0     | Tr   | 0                    | 0     | 0     | Tr (~30 gr; see KIM data)  | 0                        |          |  |  |  |  |
| 03-JR-MA-196  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (4 gr)                             | 0        | Tr   | 0     | 0.5  | 0                    | 0     | 4     | 0                          | 0                        |          |  |  |  |  |
| 03-JR-MA-197  | 0                                    | 0                  | 0         | 0     | 0                        | 0                                                     | 0        | 0    | Tr    | 2    | 0                    | 0     | Tr    | Tr (~80 gr; see KIM data)  | 0                        |          |  |  |  |  |
| 03-JR-MA-198  | 0                                    | 0                  | Tr (5 gr) | 0     | 0                        | 0                                                     | 0        | 0    | 0     | Tr   | 0                    | 0     | 0     | Tr (10 gr; see KIM data)   | 0                        |          |  |  |  |  |
| 03-JR-MA-199  | 0                                    | 0                  | 0         | 0     | 1 pale blue              | Tr low-Cr diopside (3 gr)                             | 0        | Tr   | 0     | 3    | 0                    | 0     | Tr    | Tr (~500 gr; see KIM data) | 0                        |          |  |  |  |  |
| 03-JR-MA-200  | 0                                    | 0                  | Tr (5 gr) | 0     | 0                        | Tr low-Cr diopside (4 gr)                             | 0        | 0    | Tr    | Tr   | 0                    | 0     | 0     | Tr (21 gr; see KIM data)   | 0                        |          |  |  |  |  |
| 03-JR-MA-201  | Tr (3 gr)                            | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (2 gr)                             | 0        | 0    | Tr    | 1    | 0                    | 0     | Tr    | Tr (~150 gr; see KIM data) | 0                        |          |  |  |  |  |
| 03-JR-MA-202  | 0                                    | 0                  | 0         | 0     | 0                        | 0                                                     | 0        | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (13 gr; see KIM data)   | 0                        |          |  |  |  |  |
| 03-JR-MA-203  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (5 gr)                             | 0        | Tr   | 0     | Tr   | 0                    | 0     | Tr    | Tr (14 gr; see KIM data)   | 0                        |          |  |  |  |  |

# Appendix I. MMSIM picking results

Appendix I. MMSIM picking results

Mg/Mn/Al/Cr Minerals

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |             |       |                          |                           |          |      |       |      |          |       |       |                           |                          |
|---------------|--------------------------------------|--------------------|-------------|-------|--------------------------|---------------------------|----------|------|-------|------|----------|-------|-------|---------------------------|--------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |             |       |                          | 0.25-0.5 mm               |          |      |       |      |          |       |       |                           |                          |
|               | >1.0 amp                             |                    |             |       |                          | <1.0 amp                  |          |      |       |      | >1.0 amp |       |       |                           |                          |
|               | 0.25-0.5 mm                          |                    |             |       |                          | >0.8 amp                  |          |      |       |      | <0.8 amp |       |       |                           |                          |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py        | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs        | % Rutile | % Ky | % Sil | % St | % Sps    | % Fay | % Opx | % Cr                      | Prime Carbonate Minerals |
| 03-JR-MA-204  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (8 gr) | 0        | 0    | 0     | Tr   | 0        | 0     | Tr    | 0                         | 0                        |
| 03-JR-MA-205  | Tr (2 gr)                            | 0                  | 0           | 0     | 0                        | 0                         | 0        | 0.5  | 0.5   | Tr   | 0        | 0     | 0     | Tr (8 gr, see KIM data)   | 0                        |
| 03-JR-MA-206  | 0                                    | 0                  | 0           | 0     | 0                        | 0                         | 0        | 0    | 0     | Tr   | 0        | 0     | 0     | 0                         | 0                        |
| 03-JR-MA-207  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (1 gr) | 0        | 0    | Tr    | Tr   | 0        | 0     | 4     | 0                         | 0                        |
| 03-JR-MA-208  | 0                                    | 0                  | 0           | Tr    | 0                        | 0                         | 0        | 0    | Tr    | 0    | 0        | 0     | Tr    | 0                         | 0                        |
| 03-JR-MA-209  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (2 gr) | 0        | 0    | Tr    | Tr   | 0        | 0     | Tr    | 0                         | 0                        |
| 03-JR-MA-210  | Tr (3 gr)                            | Tr Moly (1 gr)     | 2 (~600 gr) | Tr    | 0                        | Tr low-Cr diopside (6 gr) | 0        | 0    | Tr    | 0    | 0        | 0     | Tr    | Tr (~50 gr, see KIM data) | 0                        |
| 03-JR-MA-211  | 0                                    | 0                  | Tr (1 gr)   | 0     | 1 pale blue              | Tr low-Cr diopside (5 gr) | 0        | 0    | Tr    | Tr   | 0        | 0     | Tr    | Tr (49 gr, see KIM data)  | 0                        |
| 03-JR-MA-212  | 0                                    | 0                  | Tr (4 gr)   | 0     | 0                        | Tr low-Cr diopside (1 gr) | 0        | 0    | 0     | 0    | 0        | 0     | Tr    | Tr (16 gr, see KIM data)  | 0                        |
| 03-JR-MA-213  | Tr (2 gr)                            | 0                  | 0           | 0     | 0                        | 0                         | 0        | 0    | Tr    | Tr   | 0        | 0     | 0     | Tr (1 gr, see KIM data)   | 0                        |
| 03-JR-MA-214  | 0                                    | 0                  | Tr (~10 gr) | 0     | 0                        | Tr low-Cr diopside (2 gr) | 0        | 0    | 0     | 0    | 0        | 0     | 0     | Tr (1 gr, see KIM data)   | 0                        |
| 03-JR-MA-215  | 0                                    | 0                  | 0           | 0     | 0                        | 0                         | 0        | 0    | 0     | 0    | 0        | 0     | 0     | Tr (1 gr, see KIM data)   | 0                        |
| 03-JR-MA-216  | 0                                    | 0                  | 0           | Tr    | 0                        | 0                         | 0        | 0    | 0     | 0    | 0        | 0     | 2     | 0                         | 0                        |



Appendix I. MMSIM picking results

Appendix I. MMSIM picking results

| Mg/Mn/Al/Cr Minerals |                                      |  |  |  |                    |             |  |  |  |          |          |  |  |  |  |          |  |
|----------------------|--------------------------------------|--|--|--|--------------------|-------------|--|--|--|----------|----------|--|--|--|--|----------|--|
| Sample Number        | Sulphide/Arsenide + Related Minerals |  |  |  |                    | 0.25-0.5 mm |  |  |  |          |          |  |  |  |  |          |  |
|                      | >1.0 amp                             |  |  |  |                    | >1.0 amp    |  |  |  |          | >0.8 amp |  |  |  |  | >1.0 amp |  |
|                      |                                      |  |  |  |                    |             |  |  |  |          |          |  |  |  |  |          |  |
|                      |                                      |  |  |  |                    |             |  |  |  |          |          |  |  |  |  |          |  |
|                      |                                      |  |  |  |                    |             |  |  |  |          |          |  |  |  |  |          |  |
| 0.25-0.5 mm          |                                      |  |  |  | <1.0 amp           |             |  |  |  | <0.8 amp |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | % Py               |             |  |  |  | % Cr     |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | % Gth              |             |  |  |  | % Opx    |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | % Cpy              |             |  |  |  | % Fay    |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | Misc. Prime MMSIMs |             |  |  |  | St       |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | Cpy                |             |  |  |  | Sps      |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | Tr (1 gr)          |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |
| >1.0 amp             |                                      |  |  |  | 0                  |             |  |  |  | 0        |          |  |  |  |  |          |  |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |           |       |                          |                           |              |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                           |                          |          |  |  |  |  |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|-----------|-------|--------------------------|---------------------------|--------------|------|-------|------|----------------------|-------|-------|---------------------------|--------------------------|----------|--|--|--|--|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |           |       |                          |                           |              |      |       |      | 0.25-0.5 mm          |       |       |                           |                          |          |  |  |  |  |          |  |  |  |  |
|               | >1.0 amp                             |                    |           |       |                          | <1.0 amp                  |              |      |       |      | >1.0 amp             |       |       |                           |                          | <0.8 amp |  |  |  |  | >1.0 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSiMs | % Py      | % Gth | # Grains + Colour Spinel | Misc. Prime MMSiMs        | % Red Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                      | Prime Carbonate Minerals |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-226  | Tr (1 gr)                            | 0                  | 0         | Tr    | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | 0     | Tr   | 0                    | 0     | Tr    | Tr (35 gr. see KIM data)  | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-227  | 0                                    | 0                  | 0         | Tr    | 0                        | 0                         | 0            | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-228  | 0                                    | 0                  | 0         | Tr    | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | 0     | 0    | 0                    | 0     | 0     | Tr (29 gr. see KIM data)  | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-229  | 0                                    | 0                  | Tr (2 gr) | Tr    | 0                        | 0                         | 0            | 0    | Tr    | 0    | 0                    | 0     | Tr    | Tr (1 gr. see KIM data)   | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-230  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (3 gr) | 0            | 0    | 0     | 0    | 0                    | 0     | Tr    | Tr (~40 gr. see KIM data) | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-231  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (2 gr) | 0            | 0    | 0     | Tr   | 0                    | 0     | Tr    | Tr (2 gr. see KIM data)   | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-232  | 0                                    | 0                  | 0         | 0     | 0                        | 0                         | 0            | 0    | 0     | Tr   | 0                    | 0     | Tr    | Tr (~80 gr. see KIM data) | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-233  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-234  | 0                                    | 0                  | 0         | 0     | 0                        | 0                         | 0            | 0    | 0     | 0    | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-235  | 0                                    | 0                  | 0         | 0     | 0                        | 0                         | 0            | 0    | 0     | Tr   | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-236  | 0                                    | 0                  | Tr (1 gr) | 0     | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | Tr    | Tr   | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-237  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (2 gr) | 0            | 0    | Tr    | Tr   | 0                    | 0     | 0     | Tr (~40 gr. see KIM data) | 0                        |          |  |  |  |  |          |  |  |  |  |
| 03-JR-MA-238  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (1 gr) | 0            | 0    | Tr    | 0    | 0                    | 0     | 0     | 0                         | 0                        |          |  |  |  |  |          |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |               |       |                          |                                                     |          |      |       |      |          |       |       |                            |                                   |
|---------------|--------------------------------------|--------------------|---------------|-------|--------------------------|-----------------------------------------------------|----------|------|-------|------|----------|-------|-------|----------------------------|-----------------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |               |       |                          | 0.25-0.5 mm                                         |          |      |       |      |          |       |       |                            |                                   |
|               |                                      |                    |               |       |                          | 0.25-0.5 mm                                         |          |      |       |      |          |       |       |                            |                                   |
|               | >1.0 amp                             |                    |               |       |                          | >1.0 amp                                            |          |      |       |      | >0.8 amp |       |       |                            |                                   |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py          | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs                                  | % Rutile | % Ky | % Sil | % St | % Sps    | % Fay | % Ops | % Cr                       | >1.0 amp Prime Carbonate Minerals |
| 03-JR-MA-239  | Tr (1 gr)                            | 0                  | Tr (4 gr)     | 0     | 0                        | Tr low-Cr diopside (1 gr)                           | 0        | 0    | Tr    | Tr   | 0        | 0     | Tr    | Tr (35 gr. see KIM data)   | 0                                 |
| 03-JR-MA-240  | Tr (14 gr)                           | 0                  | 2 (~2000 gr)  | 0     | 1 blue-green             | Tr Cr-andradite (1 gr)<br>Tr low-Cr diopside (5 gr) | 0        | 0    | Tr    | Tr   | 0        | 0     | 0     | Tr (~40 gr. see KIM data)  | 0                                 |
| 03-JR-MA-241  | 0                                    | 0                  | 0             | 0     | 0                        | Tr Cr-grossular (1 gr)<br>Tr low-Cr diopside (1 gr) | 0        | 0    | Tr    | Tr   | Tr       | 0     | 0     | 1 (~200 gr. see KIM data)  | 0                                 |
| 03-JR-MA-242  | 0                                    | 0                  | 0             | 0     | 0                        | 0                                                   | 0        | 0    | 0     | 0    | 0        | 0     | 0     | 0                          | 0                                 |
| 03-JR-MA-243  | 0                                    | 0                  | 0             | 0     | 0                        | 0                                                   | 0        | 0    | 0     | 0    | 0        | 0     | 0     | Tr (~50 gr. see KIM data)  | 0                                 |
| 03-JR-MA-244  | 0                                    | 0                  | 0             | 0     | 0                        | 0                                                   | 0        | 0    | 0     | 0    | 0        | 0     | 0     | 0                          | 0                                 |
| 03-JR-MA-245  | Tr (1 gr)                            | 0                  | 35 (~2500 gr) | 0     | 0                        | 0                                                   | 0        | 0    | 0     | 0    | 0        | 0     | 0     | 0                          | 0                                 |
| 03-JR-MA-246  | 0                                    | 0                  | 0             | 0     | 0                        | 0                                                   | 0        | 0    | 0     | 0    | 0        | 0     | 0     | 0                          | 0                                 |
| 03-JR-MA-247  | 0                                    | 0                  | Tr (2 gr)     | 0     | 0                        | Tr low-Cr diopside (2 gr)                           | 0        | 0    | 0     | 0    | 0        | 0     | 0     | Tr (40 gr. see KIM data)   | 0                                 |
| 03-JR-MA-248  | 0                                    | 0                  | 0             | 0     | 0                        | Tr low-Cr diopside (2 gr)                           | 0        | 0    | 0     | Tr   | 0        | 0     | 0     | Tr (5 gr. see KIM data)    | 0                                 |
| 03-JR-MA-249  | Tr (1 gr)                            | 0                  | 0             | 0     | 1 grey                   | Tr low-Cr diopside (22 gr)                          | 0        | Tr   | 0     | Tr   | 0        | 0     | 0     | Tr (~150 gr. see KIM data) | 0                                 |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |             |       |                          |                                |          |      |       |          |       |       |          |                            |                          |
|---------------|--------------------------------------|--------------------|-------------|-------|--------------------------|--------------------------------|----------|------|-------|----------|-------|-------|----------|----------------------------|--------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |             |       |                          | 0.25-0.5 mm                    |          |      |       |          |       |       |          |                            |                          |
|               | >1.0 amp                             |                    |             |       |                          | >1.0 amp                       |          |      |       | >0.8 amp |       |       | <0.8 amp |                            | >1.0 amp                 |
|               | % Cpy                                | Misc. Prime MMSiMs | % Py        | % Gth | # Grains + Colour Spinel | Misc. Prime MMSiMs             | % Rutile | % Ky | % Sil | % St     | % Sps | % Fay | % Opx    | % Cr                       | Prime Carbonate Minerals |
| 03-JR-MA-250  | 0                                    | 0                  | 0           | 0     | 0                        | 0                              | 0        | 0    | 0     | 0        | 0     | Tr    | 0        | 0                          |                          |
| 03-JR-MA-251  | Tr (1 gr)                            | 0                  | Tr (2 gr)   | 0     | 1 blue-grey              | Tr low-Cr diopside (33 gr)     | 0        | Tr   | Tr    | 1        | 0     | 0     | Tr       | Tr (45 gr. see KIM data)   | 0                        |
| 03-JR-MA-252  | 0                                    | 0                  | 0           | 0     | 0                        | 0                              | 0        | 0    | 0     | 0        | 0     | 0     | Tr       | 0                          | 0                        |
| 03-JR-MA-253  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (3 gr)      | 0        | 0    | Tr    | Tr       | 0     | 0     | Tr       | Tr (1 gr. see KIM data)    | 0                        |
| 03-JR-MA-254  | Tr (1 gr)                            | 0                  | Tr (4 gr)   | 0     | 1 grey                   | Tr low-Cr diopside (16 gr)     | 0        | Tr   | Tr    | Tr       | 0     | 0     | Tr       | Tr (~100 gr. see KIM data) | 0                        |
| 03-JR-MA-255  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (10 gr)     | 0        | 0    | 0     | 2        | 0     | 0     | Tr       | Tr (1 gr. see KIM data)    | 0                        |
| 03-JR-MA-256  | 0                                    | 0                  | 0           | 0     | 0                        | 20% low-Cr diopside (~6000 gr) | 0        | 0    | 0     | 0        | 0     | 0     | Tr       | Tr (24 gr. see KIM data)   | 0                        |
| 03-JR-MA-257  | 0                                    | 0                  | 0           | 0     | 0                        | 0                              | 0        | 0    | 0     | 0        | 0     | 0     | 0        | 0                          | 0                        |
| 03-JR-MA-258  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (2 gr)      | 0        | Tr   | Tr    | Tr       | 0     | 0     | Tr       | Tr (11 gr. see KIM data)   | 0                        |
| 03-JR-MA-259  | 0                                    | 0                  | Tr (~30 gr) | 0     | 0                        | 0                              | 0        | 0    | Tr    | Tr       | 0     | 0     | Tr       | Tr (2 gr. see KIM data)    | 0                        |
| 03-JR-MA-260  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (3 gr)      | 0        | 0    | Tr    | 0.5      | 0     | 0     | Tr       | 0                          | 0                        |
| 03-JR-MA-261  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (9 gr)      | 0        | 0    | 0     | Tr       | 0     | 0     | Tr       | Tr (8 gr. see KIM data)    | 0                        |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |             |       |                          |                            |              |      |             |      |       |       |          |                           |                          |          |
|---------------|--------------------------------------|--------------------|-------------|-------|--------------------------|----------------------------|--------------|------|-------------|------|-------|-------|----------|---------------------------|--------------------------|----------|
|               | Sulphide/Arsenide + Related Minerals |                    |             |       |                          |                            |              |      | 0.25-0.5 mm |      |       |       |          |                           |                          |          |
|               | >1.0 amp                             |                    |             |       | <1.0 amp                 |                            |              |      | >1.0 amp    |      |       |       | <0.8 amp |                           |                          |          |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py        | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs         | % Red Rutile | % Ky | % Sil       | % St | % Sps | % Fay | % Opx    | % Cr                      | Prime Carbonate Minerals | >1.0 amp |
| 03-JR-MA-262  | 0                                    | 0                  | Tr (~20 gr) | 0     | 1 pale blue              | Tr low-Cr diopside (46 gr) | 0            | Tr   | 0           | Tr   | 0     | 0     | 0        | Tr (~70; see KIM data)    | 0                        |          |
| 03-JR-MA-263  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (3 gr)  | 0            | 0    | Tr          | Tr   | 0     | 0     | Tr       | Tr (3 gr; see KIM data)   | 0                        |          |
| 03-JR-MA-264  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (27 gr) | 0            | 0    | 0           | 2    | 0     | 0     | Tr       | Tr (~50 gr; see KIM data) | 0                        |          |
| 03-JR-MA-265  | 0                                    | 0                  | 0           | 0     | 0                        | 0                          | 0            | 0    | Tr          | Tr   | 0     | 0     | Tr       | Tr                        | 0                        |          |
| 03-JR-MA-266  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (3 gr)  | 0            | 0    | Tr          | Tr   | 0     | 0     | Tr       | Tr (~50 gr; see KIM data) | 0                        |          |
| 03-JR-MA-267  | 0                                    | 0                  | 0           | 0     | 0                        | 0                          | 0            | 0    | Tr          | 0    | 0     | 0     | 0        | 0                         | 0                        |          |
| 03-JR-MA-268  | 0                                    | 0                  | 0           | Tr    | 0                        | 0                          | 0            | 0    | Tr          | Tr   | 0     | 0     | Tr       | Tr (4 gr; see KIM data)   | 0                        |          |
| 03-JR-MA-269  | 0                                    | 0                  | 0           | Tr    | 0                        | 0                          | 0            | 0    | Tr          | 0    | 0     | 0     | 0        | Tr (1 gr; see KIM data)   | 0                        |          |
| 03-JR-MA-270  | 0                                    | 0                  | 0           | 0     | 0                        | 0                          | 0            | Tr   | 0           | 0    | 0     | 0     | 0        | 0                         | 0                        |          |
| 03-JR-MA-271  | 0                                    | 0                  | 0           | 0     | 0                        | Tr low-Cr diopside (4 gr)  | 0            | 0    | Tr          | Tr   | 0     | 0     | Tr       | Tr (3 gr; see KIM data)   | 0                        |          |
| 03-JR-MA-272  | 0                                    | 0                  | 0           | 0     | 1 blue-green             | Tr low-Cr diopside (29 gr) | 0            | 0    | 0           | Tr   | Tr    | 0     | 0        | Tr (2 gr; see KIM data)   | 0                        |          |
| 03-JR-MA-273  | 0                                    | 0                  | 0           | 0     | 0                        | Tr                         | 0            | 0    | Tr          | Tr   | 0     | 0     | Tr       | Tr (13 gr; see KIM data)  | 0                        |          |
| 03-JR-MA-274  | Tr (1 gr)                            | 0                  | Tr (~15 gr) | 0     | 1 green                  | Tr low-Cr diopside (1 gr)  | 0            | 0    | Tr          | Tr   | 0     | 0     | 4        | Tr                        | 0                        |          |

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |      |             |   |                                                 |                    |              |      |       |          |       |       |                             |                           |
|---------------|--------------------------------------|------|-------------|---|-------------------------------------------------|--------------------|--------------|------|-------|----------|-------|-------|-----------------------------|---------------------------|
|               | Sulphide/Arsenide + Related Minerals |      |             |   | 0.25-0.5 mm                                     |                    |              |      |       |          |       |       |                             |                           |
|               | 0.25-0.5 mm                          |      |             |   | >1.0 amp                                        |                    |              |      |       | <0.8 amp |       |       |                             | >1.0 amp                  |
|               | >1.0 amp                             |      | <1.0 amp    |   | # Grains + Colour Spinel                        | Misc. Prime MMSiMs | % Red Rutile | % Ky | % Sil | % Sps    | % Fay | % Opx | % Cr                        | Prime Carbonatic Minerals |
| % Cpy         | Misc. Prime MMSiMs                   | % Py | % Gth       |   |                                                 |                    |              |      |       |          |       |       |                             |                           |
| 03-JR-MA-275  | Tr (1 gr)                            | 0    | Tr (~20 gr) | 0 | Tr low-Cr diopside (13 gr)                      | 0                  | 0            | Tr   | 0     | 0        | 0     | Tr    | 0.3 (~100 gr, see KIM data) | 0                         |
| 03-JR-MA-276  | 0                                    | 0    | 0           | 0 | Tr low-Cr diopside (5 gr)                       | 0                  | 0            | Tr   | 0     | 0        | 0     | 2     | Tr (~50 gr, see KIM data)   | 0                         |
| 03-JR-MA-277  | 0                                    | 0    | 0           | 0 | Tr low-Cr diopside (11 gr)                      | 0                  | 0            | Tr   | 0     | 0        | 0     | 2     | Tr (20 gr, see KIM data)    | 0                         |
| 03-JR-MA-278  | 0                                    | 0    | 0           | 0 | 0                                               | 0                  | 0            | 0    | 0     | 0        | 0     | Tr    | 0.5 (44 gr, see KIM data)   | 0                         |
| 03-JR-MA-279  | 0                                    | 0    | 0           | 0 | Mn-epidote (1 gr)                               | 0                  | 0            | 0    | 0     | 0        | 0     | Tr    | Tr (~40 gr, see KIM data)   | 0                         |
| 03-JR-MA-280  | 0                                    | 0    | 0           | 0 | 0                                               | 0                  | 0            | 0    | 0     | 0        | 0     | 2     | 0                           | 0                         |
| 03-JR-MA-281  | 0                                    | 0    | 0           | 0 | 0                                               | 0                  | 0            | 0    | 0     | 0        | 0     | 0     | 0                           | 0                         |
| 03-JR-MA-282  | 0                                    | 0    | 0           | 0 | 0                                               | 0                  | 0            | 0    | 0     | 0        | 0     | Tr    | 0                           | 0                         |
| 03-JR-MA-283  | 0                                    | 0    | 0           | 0 | Tr low-Cr diopside (4 gr)                       | 0                  | 0            | Tr   | 0     | 0        | 0     | Tr    | 0.5 (26 gr, see KIM data)   | 0                         |
| 03-JR-MA-284  | 0                                    | 0    | 0           | 0 | 0                                               | 0                  | Tr           | Tr   | 0     | 0        | 0     | Tr    | Tr (1 gr, see KIM data)     | 0                         |
| 03-JR-MA-285  | 0                                    | 0    | 0           | 0 | Mn-epidote (1 gr)<br>Tr low-Cr diopside (17 gr) | 0                  | Tr           | Tr   | 0     | 0        | 0     | Tr    | Tr (5 gr, see KIM data)     | 0                         |



Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |               |       |                                            |                                                                           |          |      |       |      |
|---------------|--------------------------------------|--------------------|---------------|-------|--------------------------------------------|---------------------------------------------------------------------------|----------|------|-------|------|
|               | Sulphide/Arsenide + Related Minerals |                    |               |       |                                            | 0.25-0.5 mm                                                               |          |      |       |      |
|               | >1.0 amp                             |                    |               |       |                                            | >1.0 amp                                                                  |          |      |       |      |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py          | % Gth | # Grains + Colour Spinel                   | Misc. Prime MMSIMs                                                        | % Rutile | % Ky | % Sil | % St |
| 03-JR-MA-286  | 0                                    | 0                  | Tr (1 gr)     | 0     | 0                                          | Tr low-Cr diopside (1 gr)                                                 | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-287  | 0                                    | 0                  | Tr (4 gr)     | 0     | 0                                          | 0                                                                         | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-288  | 0                                    | 0                  | 0             | 0     | 0                                          | Tr Cr-andradite (1 gr)<br>Tr low-Cr diopside (10 gr)                      | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-289  | 0                                    | 0                  | 0             | 0     | 0                                          | Tr low-Cr diopside (6 gr)                                                 | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-290  | 0                                    | 0                  | 0.5 (~150 gr) | 0     | 0                                          | Tr low-Cr diopside (9 gr)                                                 | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-291  | 0                                    | 0                  | 0             | 0     | 0                                          | 0                                                                         | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-292  | 0                                    | 0                  | Tr (2 gr)     | 0     | 1 blue-green garnet;<br>1 pale blue spinel | Tr sapphirine (1 gr)<br>Tr Mn-epidote (1 gr)<br>Tr low-Cr diopside (1 gr) | 0        | 0    | Tr    | Tr   |
| 03-JR-MA-293  | 0                                    | 0                  | 0             | 0     | 0                                          | Tr low-Cr diopside (3 gr)                                                 | 0        | 0    | Tr    | Tr   |

## Appendix I. MMSIM picking results

[illegible]

Appendix I. MMSIM picking results

| Sample Number | Mg/Mn/Al/Cr Minerals                 |                    |           |          |                          |                           |           |             |       |      |       |          |       |                             |
|---------------|--------------------------------------|--------------------|-----------|----------|--------------------------|---------------------------|-----------|-------------|-------|------|-------|----------|-------|-----------------------------|
|               | Sulphide/Arsenide + Related Minerals |                    |           |          |                          |                           |           | 0.25-0.5 mm |       |      |       |          |       |                             |
|               | 0.25-0.5 mm                          |                    |           |          |                          |                           |           | >1.0 amp    |       |      |       |          |       |                             |
|               | >1.0 amp                             |                    |           | <1.0 amp |                          |                           |           | >1.0 amp    |       |      |       | >0.8 amp |       |                             |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth    | # Grains + Colour Spinel | Misc. Prime MMSIMs        | % Rutile  | % Ky        | % Sil | % St | % Sps | % Fay    | % Opx | % Cr                        |
| 03-JR-MA-304  | 0                                    | 0                  | 0         | 0        | 0                        | Tr low-Cr diopside (7 gr) | 0         | 0           | Tr    | Tr   | 0     | 0        | Tr    | Tr (~80 gr. see KIM data)   |
| 03-JR-MA-305  | 0                                    | 0                  | 0         | 0        | 0                        | 0                         | 0         | 0           | 0     | 0    | 0     | 0        | 0     | 0                           |
| 03-JR-MA-306  | 0                                    | 0                  | 0         | 0        | 0                        | 0                         | 0         | 0           | 0     | 0    | 0     | 0        | 0     | 0                           |
| 03-JR-MA-307  | 0                                    | 0                  | 0         | 0        | 0                        | 0                         | 0         | 0           | 0     | 0    | 0     | 0        | 0.5   | Tr (1 gr. see KIM data)     |
| 03-JR-MA-308  | 0                                    | 0                  | Tr (1 gr) | 0        | 0                        | 0                         | 0         | 0           | Tr    | 0    | 0     | 0        | 0     | Tr (1 gr. see KIM data)     |
| 03-JR-MA-309  | 0                                    | 0                  | Tr (2 gr) | 0        | 2 pale purple, blue-grey | Tr low-Cr diopside (9 gr) | Tr (1 gr) | 0           | Tr    | Tr   | 0     | Tr       | Tr    | 0.5 (~800 gr. see KIM data) |
| 03-JR-MA-310  | 0                                    | 0                  | 0         | 0        | 0                        | Tr low-Cr diopside (1 gr) | 0         | 0           | Tr    | Tr   | 0     | 0        | Tr    | Tr (~300 gr. see KIM data)  |
| 03-JR-MA-312  | 0                                    | 0                  | 0         | 0        | 0                        | Tr Cr-andradite (1 gr)    | 0         | Tr          | Tr    | Tr   | 0     | 0        | 0     | Tr (1 gr. see KIM data)     |
| 03-JR-MA-313  | 0                                    | 0                  | 0         | 0        | 0                        | Tr low-Cr diopside (3 gr) | 0         | 0           | Tr    | Tr   | 0     | 0        | 0     | Tr (5 gr. see KIM data)     |
| 03-JR-MA-314  | 0                                    | 0                  | 0         | 0        | 0                        | Tr low-Cr diopside (1 gr) | 0         | Tr          | Tr    | Tr   | 0     | 0        | 0     | 1 (~100 gr. see KIM data)   |
| 03-JR-MA-315  | 0                                    | 0                  | 0         | 0        | 0                        | Tr low-Cr diopside (1 gr) | 0         | 0           | Tr    | Tr   | 0     | 0        | 0     | Tr (6 gr. see KIM data)     |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |           |       |             |          |  |  |  |   | Mg/Mn/Al/Cr Minerals     |                                                   |          |      |       |          |       |       |       |                            |                          |  |  |  |  |
|---------------|--------------------------------------|--------------------|-----------|-------|-------------|----------|--|--|--|---|--------------------------|---------------------------------------------------|----------|------|-------|----------|-------|-------|-------|----------------------------|--------------------------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |           |       |             | <1.0 amp |  |  |  |   | 0.25-0.5 mm              |                                                   |          |      |       | >1.0 amp |       |       |       |                            |                          |  |  |  |  |
|               | >1.0 amp                             |                    |           |       |             | <1.0 amp |  |  |  |   | >1.0 amp                 |                                                   |          |      |       | <0.8 amp |       |       |       |                            | >1.0 amp                 |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth |             |          |  |  |  |   | # Grains + Colour Spinel | Misc. Prime MMSIMs                                | % Rutile | % Ky | % Sil | % St     | % Sps | % Fay | % Opx | % Cr                       | Prime Carbonate Minerals |  |  |  |  |
| 03-JR-MA-316  | 0                                    | 0                  | 0         | 0     |             |          |  |  |  | 0 | 0                        | 0                                                 | 0        | 0    | Tr    | 0        | 0     | 10    | Tr    | Tr (~60 gr. see KIM data)  | 0                        |  |  |  |  |
| 03-JR-MA-317  | 0                                    | 0                  | 0         | 0     |             |          |  |  |  | 0 | 0                        | Cr-grossular (4 gr)<br>Tr low-Cr diopside (13 gr) | 0        | 0    | Tr    | Tr       | 0     | 0     | Tr    | 0.5 (~80 gr. see KIM data) | 0                        |  |  |  |  |
| 03-JR-BD-001  | 0                                    | 0                  | 0         | 0     |             |          |  |  |  | 0 | 0                        | Tr low-Cr diopside (3 gr)                         | 0        | 0    | 0     | Tr       | 0     | 0     | Tr    | Tr (1 gr. see KIM data)    | 0                        |  |  |  |  |
| 03-JR-BD-002  | 0                                    | 0                  | 0         | 0     |             |          |  |  |  | 0 | 0                        | 0                                                 | 0        | 0    | Tr    | Tr       | 0     | 0     | Tr    | Tr (2 gr. see KIM data)    | 0                        |  |  |  |  |
| 03-JR-BD-003  | 0                                    | Tr cuprite (2 gr)  | 0         | 0     |             |          |  |  |  | 0 | 0                        | Tr low-Cr diopside (6 gr)                         | 0        | 0    | Tr    | Tr       | 0     | 0     | 0     | Tr (7 gr. see KIM data)    | 0                        |  |  |  |  |
| 03-JR-BD-004  | 0                                    | 0                  | 0         | 0     |             |          |  |  |  | 0 | 0                        | Tr low-Cr diopside (3 gr)                         | 0        | 0    | 0     | Tr       | 0     | 0     | 0     | 0                          | 0                        |  |  |  |  |
| 03-JR-BD-005  | 0                                    | 0                  | Tr (4 gr) | 0     |             |          |  |  |  | 0 | 0                        | Tr low-Cr diopside (11 gr)                        | 0        | 0    | 0     | Tr       | 0     | 0     | Tr    | Tr (14 gr. see KIM data)   | 0                        |  |  |  |  |
| 03-JR-BD-006  | Tr (2 gr)                            | 0                  | Tr (8 gr) | 0     | 1 pale blue |          |  |  |  | 0 | 0                        | Tr low-Cr diopside (25 gr)                        | 0        | 0    | Tr    | Tr       | 0     | 0     | Tr    | Tr (10 gr. see KIM data)   | 0                        |  |  |  |  |
| 03-JR-BD-007  | 0                                    | 0                  | 0         | 0     | 0           |          |  |  |  | 0 | 0                        | Tr low-Cr diopside (2 gr)                         | 0        | 0    | Tr    | 1        | 0     | 0     | 4     | Tr (6 gr. see KIM data)    | 0                        |  |  |  |  |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |           |       |                          |                                                     |              |      |       |      | Mg/Mn/Al/Cr Minerals |       |       |                             |                          |          |  |  |  |  |
|---------------|--------------------------------------|--------------------|-----------|-------|--------------------------|-----------------------------------------------------|--------------|------|-------|------|----------------------|-------|-------|-----------------------------|--------------------------|----------|--|--|--|--|
|               | 0.25-0.5 mm                          |                    |           |       |                          |                                                     |              |      |       |      | 0.25-0.5 mm          |       |       |                             |                          |          |  |  |  |  |
|               | >1.0 amp                             |                    |           |       |                          | <1.0 amp                                            |              |      |       |      | >1.0 amp             |       |       |                             |                          | >0.8 amp |  |  |  |  |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth | # Grains + Colour Spinel | Misc. Prime MMSIMs                                  | % Red Rutile | % Ky | % Sil | % St | % Sps                | % Fay | % Opx | % Cr                        | Prime Carbonate Minerals | >1.0 amp |  |  |  |  |
| 03-JR-BD-008  | 0                                    | 0                  | 0         | 0     | 1 green garnite          | Tr Cr-andradite (1 gr)<br>Tr low-Cr diopside (4 gr) | 0            | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (~250 gr. see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-BD-009  | 0                                    | 0                  | Tr (2 gr) | 0     | 0                        | Tr low-Cr diopside (13 gr)                          | 0            | Tr   | Tr    | Tr   | 0                    | 0     | Tr    | Tr (~1000 gr. see KIM data) | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-BD-010  | 0                                    | 0                  | Tr (1 gr) | 0     | 0                        | Tr Cr-andradite (1 gr)<br>Tr low-Cr diopside (1 gr) | 0            | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (~50 gr. see KIM data)   | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-BD-011  | Tr (2 gr)                            | 0                  | Tr (2 gr) | Tr    | 0                        | Tr low-Cr diopside (2 gr)                           | 0            | 0    | Tr    | 0    | 0                    | 0     | Tr    | Tr (13 gr. see KIM data)    | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-BD-012  | 0                                    | 0                  | Tr (1 gr) | Tr    | 0                        | Tr ruby corundum (1 gr)                             | 0            | 0    | Tr    | Tr   | 0                    | 0     | Tr    | Tr (~200 gr. see KIM data)  | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-SG-001  | 0                                    | 0                  | 0         | 0     | 0                        | Tr low-Cr diopside (9 gr)                           | Tr (1 gr)    | 0    | 0     | Tr   | 0                    | 0     | 0     | Tr (41 gr. see KIM data)    | 0                        | >1.0 amp |  |  |  |  |
| 03-JR-SG-002  | Tr (1 gr)                            | 0                  | 0         | 0     | 0                        | Tr grossular (2 gr)<br>Tr low-Cr diopside (19 gr)   | 0            | 0    | 0     | 0    | 0                    | 0     | 3     | Tr (3 gr. see KIM data)     | 0                        | >1.0 amp |  |  |  |  |

## Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |             |          | Mg/Mn/Al/Cr Minerals     |                            |                    |          |      |       |      |          |          |                             |       |          |
|---------------|--------------------------------------|--------------------|-------------|----------|--------------------------|----------------------------|--------------------|----------|------|-------|------|----------|----------|-----------------------------|-------|----------|
|               | 0.25-0.5 mm                          |                    |             |          | 0.25-0.5 mm              |                            |                    |          |      |       |      |          |          |                             |       |          |
|               | >1.0 amp                             |                    |             | <1.0 amp | >1.0 amp                 |                            |                    |          |      |       |      | >0.8 amp | <0.8 amp |                             |       | >1.0 amp |
|               | % Cpy                                | Misc. Prime MMSiMs | % Py        |          | % Gth                    | # Grains + Colour Spinel   | Misc. Prime MMSiMs | % Rutile | % Ky | % Sil | % St |          | % Sps    | % Fay                       | % Opx |          |
| 03-JR-SG-003  | 0                                    | 0                  | 0           | 0        | 0                        | Tr low-Cr diopside (10 gr) | 0                  | 0        | 0    | Tr    | 0    | 0        | 5        | Tr (10 gr. see KIM data)    | 0     |          |
| 03-JR-SG-004  | 0                                    | 0                  | 0           | 0        | 0                        | Tr low-Cr diopside (1 gr)  | 0                  | 0        | 0    | Tr    | Tr   | 0        | 0        | 0                           | 0     |          |
| 03-JR-SG-005  | 0                                    | 0                  | 0           | 0        | 0                        | 0                          | 0                  | 0        | 0    | Tr    | 0    | 0        | 0        | Tr (2 gr. see KIM data)     | 0     |          |
| 03-JR-SG-006  | Tr (1 gr)                            | 0                  | Tr (3 gr)   | 0        | 2 pale purple, pale blue | Tr low-Cr diopside (8 gr)  | 0                  | 0        | 0    | 1     | 0    | 0        | 2        | Tr (13 gr. see KIM data)    | 0     |          |
| 03-JR-SG-007  | Tr (2 gr)                            | 0                  | Tr (5 gr)   | 0        | 0                        | Tr low-Cr diopside (4 gr)  | 0                  | 0        | 0    | Tr    | 0    | 1        | 2        | Tr (35 gr. see KIM data)    | 0     |          |
| 03-JR-SG-008  | 0                                    | 0                  | Tr (2 gr)   | 0        | 0                        | Tr low-Cr diopside (4 gr)  | 0                  | 0        | Tr   | Tr    | 0    | 5        | Tr       | Tr (10 gr. see KIM data)    | 0     |          |
| 03-JR-SG-009  | 0                                    | 0                  | 0           | 0        | 0                        | Tr low-Cr diopside (11 gr) | 0                  | Tr       | Tr   | 0.5   | 0    | Tr       | Tr       | Tr (20 gr. see KIM data)    | 0     |          |
| 03-JR-SG-010  | 0                                    | 0                  | Tr (~20 gr) | Tr       | 1 blue-green             | Tr low-Cr diopside (4 gr)  | 0                  | 0        | 0    | Tr    | 0    | Tr       | Tr       | Tr (~300 gr. see KIM data)  | 0     |          |
| 03-JR-SG-011  | 0                                    | 0                  | 0           | 0        | 0                        | Tr low-Cr diopside (4 gr)  | Tr (1 gr)          | 0        | 0    | 0     | Tr   | 0        | Tr       | 0.5 (~150 gr. see KIM data) | 0     |          |
| 03-JR-SG-012  | 0                                    | 0                  | 0           | Tr       | 1 pale blue              | Tr low-Cr diopside (10 gr) | 0                  | Tr       | Tr   | 2     | 0    | 0        | 2        | Tr (32 gr. see KIM data)    | 0     |          |



| Sample Number | Mg/Mn/Al/Cr Minerals                 |      |            |                          |                    |                                               |           |       |          |       |          |       |                            |                            |   |
|---------------|--------------------------------------|------|------------|--------------------------|--------------------|-----------------------------------------------|-----------|-------|----------|-------|----------|-------|----------------------------|----------------------------|---|
|               | Sulphide/Arsenide + Related Minerals |      |            |                          |                    | 0.25-0.5 mm                                   |           |       |          |       |          |       |                            |                            |   |
|               | 0.25-0.5 mm                          |      |            |                          |                    |                                               |           |       |          |       |          |       |                            |                            |   |
|               | >1.0 amp                             |      |            | <1.0 amp                 |                    | >1.0 amp                                      |           |       | >0.8 amp |       | <0.8 amp |       |                            | >1.0 amp                   |   |
| % Cpy         | Misc. Prime MMSiMs                   | % Py | % Gth      | # Grains + Colour Spinel | Misc. Prime MMSiMs | % Rutile                                      | % Ky      | % Sil | % St     | % Sps | % Fay    | % Opx | % Cr                       | Prime Carbonate Minerals   |   |
| 03-JR-SG-013  | Tr (1 gr)                            | 0    | 0          | 0                        | 0                  | Tr low-Cr diopside (3 gr)                     | 0         | 0     | 0        | Tr    | 0        | 15    | Tr                         | Tr (~150 gr; see KIM data) | 0 |
| 03-JR-SG-014  | 0                                    | 0    | 0          | 0                        | 0                  | 0                                             | 0         | 0     | Tr       | 0     | Tr       | Tr    | Tr (2 gr; see KIM data)    | 0                          |   |
| 03-JR-SG-015  | 0                                    | 0    | 0          | Tr                       | 1 pale blue        | Tr topaz (1 gr)<br>Tr low-Cr diopside (15 gr) | Tr (1 gr) | 0     | Tr       | 0     | Tr       | Tr    | Tr (~100 gr; see KIM data) | 0                          |   |
| 03-JR-SG-016  | Tr (10 gr)                           | 0    | Tr (10 gr) | Tr                       | 0                  | Tr Cr-grossular (1 gr)                        | 0         | 0     | Tr       | 0     | 5        | 2     | Tr (~120 gr; see KIM data) | 0                          |   |
| 03-JR-SG-017  | 0                                    | 0    | 0          | 0                        | 0                  | Tr low-Cr diopside (10 gr)                    | 0         | 0     | Tr       | 0     | 0        | Tr    | Tr (6 gr; see KIM data)    | 0                          |   |
| 03-JR-SG-018  | 0                                    | 0    | 0          | 0                        | 0                  | 0                                             | 0         | Tr    | 0        | 0     | 0        | Tr    | Tr (15 gr; see KIM data)   | 0                          |   |
| 03-JR-SG-019  | 0                                    | 0    | 0          | 0                        | 0                  | Tr low-Cr diopside (2 gr)                     | 0         | Tr    | Tr       | 0     | 0        | Tr    | Tr (7 gr; see KIM data)    | 0                          |   |
| 03-JR-SG-020  | 0                                    | 0    | 0          | 0                        | 0                  | Tr low-Cr diopside (4 gr)                     | 0         | Tr    | Tr       | 0     | 0        | 3     | Tr (9 gr; see KIM data)    | 0                          |   |
| 03-JR-SG-021  | 0                                    | 0    | Tr (10 gr) | Tr                       | 0                  | Tr low-Cr diopside (4 gr)                     | 0         | 0     | Tr       | 0     | Tr       | Tr    | Tr (7 gr; see KIM data)    | 0                          |   |

Appendix I. MMSIM picking results

| Sample Number | Sulphide/Arsenide + Related Minerals |                    |           |       |  |          |                    |           |       |   | Mg/Mn/Al/Cr Minerals      |                            |              |      |       |          |       |       |       |                             |          |
|---------------|--------------------------------------|--------------------|-----------|-------|--|----------|--------------------|-----------|-------|---|---------------------------|----------------------------|--------------|------|-------|----------|-------|-------|-------|-----------------------------|----------|
|               | 0.25-0.5 mm                          |                    |           |       |  |          |                    |           |       |   | 0.25-0.5 mm               |                            |              |      |       |          |       |       |       |                             |          |
|               | >1.0 amp                             |                    |           |       |  | <1.0 amp |                    |           |       |   | >1.0 amp                  |                            |              |      |       | >0.8 amp |       |       |       |                             |          |
|               | % Cpy                                | Misc. Prime MMSIMs | % Py      | % Gth |  | % Cpy    | Misc. Prime MMSIMs | % Py      | % Gth |   | # Grains + Colour Spinel  | Misc. Prime MMSIMs         | % Red Rutile | % Ky | % Sil | % St     | % Sps | % Fay | % Opx | % Cr                        | >1.0 amp |
| 03-JR-SG-022  | 0                                    | 0                  | 0         | 0     |  | 0        | 0                  | 0         |       | 0 | Tr low-Cr diopside (3 gr) | 0                          | 0            | 0    | Tr    | Tr       | 0     | 0.5   | Tr    | Tr (-40 gr. see KIM data)   | 0        |
| 03-JR-TM-001  | 0                                    | 0                  | Tr (3 gr) | Tr    |  | 0        | 0                  | Tr (3 gr) | Tr    |   | 0                         | Tr low-Cr diopside (5 gr)  | 0            | 0    | Tr    | Tr       | 0     | 10    | 7     | Tr (~150 gr. see KIM data)  | 0        |
| 03-JR-TM-002  | 0                                    | 0                  | Tr (2 gr) | Tr    |  | 0        | 0                  | Tr (2 gr) | Tr    |   | 0                         | 0                          | 0            | Tr   | 0     | Tr       | 0     | 0     | Tr    | Tr (~150 gr. see KIM data)  | 0        |
| 03-JR-TM-003  | 0                                    | 0                  | 0         | 1     |  | 0        | 0                  | 0         | 1     |   | 0                         | 0                          | 0            | 0    | 0     | 0        | 0     | 0     | 2     | 0                           | 0        |
| 03-JR-TM-004  | 0                                    | 0                  | 0         | 0     |  | 0        | 0                  | 0         | 0     |   | 0                         | Tr low-Cr diopside (1 gr)  | 0            | 0    | 0     | 0        | 0     | Tr    | 12    | Tr (~80 gr. see KIM data)   | 0        |
| 03-JR-TM-005  | Tr (1 gr)                            | 0                  | 0         | Tr    |  | 0        | 0                  | 0         | Tr    |   | 0                         | Tr low-Cr diopside (3 gr)  | 0            | 0    | 0     | Tr       | 0     | Tr    | Tr    | 0.5 (~100 gr. see KIM data) | 0        |
| 03-JR-TM-006  | 0                                    | 0                  | 0         | Tr    |  | 0        | 0                  | 0         | Tr    |   | 0                         | Tr low-Cr diopside (14 gr) | 0            | 0    | 0     | Tr       | 0     | 35    | Tr    | Tr (~80 gr. see KIM data)   | 0        |

## Appendix J

### PEBBLE LITHOLOGY COUNTS

#### Summary List of Abbreviations

|     |                     |
|-----|---------------------|
| FI  | Felsic intrusive    |
| MI  | Mafic intrusive     |
| GN  | Gneiss              |
| FM  | Felsic metavolcanic |
| MM  | Mafic metavolcanic  |
| SED | Sedimentary         |
| OTH | Other               |

Appendix J. Pebble Lithology Counts

| Sample       | Rock Type | Fl %      | MI % | GN % | FMV % | MMV % | SED % | OTH % | Total<br>Volcanics | Total<br>Intrusives | Total<br>Sedimentary |
|--------------|-----------|-----------|------|------|-------|-------|-------|-------|--------------------|---------------------|----------------------|
| 03-JR-MA-055 | GN        | 0         | 81   | 17   | 0     | 2     | 0     | 0     | 98                 | 2                   | 0                    |
| 03-JR-MA-063 | GN        | 0         | 77   | 15   | 0     | 8     | 0     | 0     | 92                 | 8                   | 0                    |
| 03-JR-MA-066 | GN        | 0         | 65   | 25   | 0     | 4     | 0     | 7     | 89                 | 4                   | 0                    |
| 03-JR-MA-070 | GN        | 0         | 58   | 33   | 0     | 9     | 0     | 0     | 91                 | 9                   | 0                    |
| 03-JR-MA-076 | GN        | 0         | 71   | 24   | 0     | 3     | 0     | 2     | 95                 | 3                   | 0                    |
| 03-JR-MA-077 | SED       | 15        | 54   | 23   | 2     | 6     | 0     | 0     | 77                 | 8                   | 0                    |
| 03-JR-MA-084 | FI        | 0         | 68   | 17   | 2     | 10    | 0     | 2     | 86                 | 12                  | 0                    |
| 03-JR-MA-094 | MI        | 0         | 89   | 0    | 11    | 0     | 0     | 0     | 89                 | 11                  | 0                    |
| 03-JR-MA-122 | SED       | 0         | 7    | 24   | 0     | 69    | 0     | 0     | 31                 | 69                  | 0                    |
| 03-JR-MA-128 | SED       | 0         | 13   | 33   | 0     | 54    | 0     | 0     | 46                 | 54                  | 0                    |
| 03-JR-MA-130 | GN        | 0         | 46   | 40   | 0     | 13    | 0     | 0     | 85                 | 13                  | 0                    |
| 03-JR-MA-144 | MMV       | 0         | 25   | 0    | 2     | 71    | 0     | 2     | 25                 | 73                  | 0                    |
| 03-JR-MA-148 | FI        | 0         | 10   | 62   | 0     | 28    | 0     | 0     | 72                 | 28                  | 0                    |
| 03-JR-MA-150 | MMV       | 0         | 100  | 0    | 0     | 0     | 0     | 0     | 100                | 0                   | 0                    |
| 03-JR-MA-158 | SED       | 0         | 23   | 27   | 0     | 46    | 0     | 4     | 50                 | 46                  | 0                    |
| 03-JR-MA-160 | SED       | 0         | 50   | 50   | 0     | 0     | 0     | 0     | 100                | 0                   | 0                    |
| 03-JR-MA-161 | SED       | 0         | 73   | 0    | 0     | 23    | 0     | 4     | 73                 | 23                  | 0                    |
| 03-JR-MA-163 | MI        | 0         | 0    | 100  | 0     | 0     | 0     | 0     | 100                | 0                   | 0                    |
| 03-JR-MA-164 | SED       | 0         | 9    | 38   | 0     | 53    | 0     | 0     | 47                 | 53                  | 0                    |
| 03-JR-MA-165 | SED       | 0         | 11   | 82   | 0     | 5     | 0     | 27    | 93                 | 5                   | 0                    |
| 03-JR-MA-166 | SED       | 0         | 35   | 0    | 3     | 60    | 0     | 2     | 35                 | 63                  | 0                    |
| 03-JR-MA-167 | MI        | 0         | 0    | 2    | 0     | 98    | 0     | 0     | 2                  | 98                  | 0                    |
| 03-JR-MA-172 | SED       | 2         | 0    | 50   | 0     | 48    | 0     | 0     | 50                 | 48                  | 2                    |
| 03-JR-MA-201 | FI        | 0         | 50   | 30   | 0     | 20    | 0     | 0     | 80                 | 20                  | 0                    |
| 03-JR-MA-213 | SED       | 2         | 26   | 72   | 0     | 0     | 0     | 0     | 98                 | 0                   | 2                    |
| 03-JR-MA-217 | MI        | two small |      |      |       |       |       |       |                    |                     |                      |
| 03-JR-SG-001 | GN        | 0         | 57   | 24   | 0     | 20    | 0     | 0     | 80                 | 20                  | 0                    |
| 03-JR-SG-002 | GN        | 0         | 74   | 20   | 0     | 6     | 0     | 0     | 94                 | 6                   | 0                    |
| 03-JR-SG-003 | SED       | 2         | 50   | 42   | 0     | 6     | 0     | 0     | 92                 | 6                   | 2                    |
| 03-JR-SG-005 | SED       | 0         | 58   | 30   | 0     | 12    | 0     | 0     | 88                 | 12                  | 0                    |
| 03-JR-SG-006 | MMV       | 0         | 18   | 53   | 0     | 28    | 0     | 0     | 72                 | 28                  | 0                    |
| 03-JR-SG-007 | MMV       | 0         | 24   | 43   | 0     | 33    | 0     | 0     | 68                 | 33                  | 0                    |
| 03-JR-SG-008 | SED       | 0         | 42   | 44   | 0     | 12    | 0     | 2     | 88                 | 12                  | 0                    |
| 03-JR-SG-009 | MMV       | 0         | 33   | 46   | 0     | 22    | 0     | 0     | 78                 | 22                  | 0                    |
| 03-JR-SG-013 | GN        | 0         | 45   | 47   | 0     | 8     | 0     | 0     | 92                 | 8                   | 0                    |
| 03-JR-SG-016 | SED       | 0         | 35   | 52   | 4     | 8     | 0     | 0     | 87                 | 13                  | 0                    |
| 03-JR-SG-020 | MMV       | 0         | 25   | 7    | 11    | 38    | 0     | 1     | 50                 | 50                  | 0                    |
| 03-JR-TM-004 | MI        | 0         | 0    | 98   | 0     | 2     | 0     | 0     | 98                 | 2                   | 0                    |
| 03-JR-TM-005 | GN        | 0         | 16   | 38   | 2     | 42    | 2     | 0     | 54                 | 44                  | 0                    |

## Appendix K

### SUMMARY OF NORMALIZED KIMBERLITE INDICATOR MINERAL RESULTS

|     |                                                   |
|-----|---------------------------------------------------|
| KIM | Kimberlitic                                       |
| CR  | Chromite                                          |
| (p) | Amount of <i>grains</i> picked from sample        |
| (e) | Amount of <i>grains</i> estimated to be in sample |
| tot | total                                             |

Total KIM chromites include those that plot within the overlap field and are considered to possibly be of kimberlitic affinity

## Sample Calculation

### \* Picked Estimate Normalization

#### Example

For sample 03-JR-MA-0006, 500 chromites were estimated to be present but only 116 chromites were removed (picked). Microprobe analysis confirmed that 87 were kimberlitic. The normalization is calculated as follows:

$$\begin{aligned}\text{\# of normalized grains} &= \frac{(\text{estimated \# grains})}{(\text{\# of picked grains})} \times (\text{\# of confirmed KIMS}) \\ &= \frac{500}{116} \times 87 \\ &= 375 \text{ grains}\end{aligned}$$



# Appendix K. Normalized KIM results

| Sample Number | KIM Count |        | Total KIMs Probed |              |          | picked estimate<br>normalization<br>tot KIM CR |
|---------------|-----------|--------|-------------------|--------------|----------|------------------------------------------------|
|               | CR (p)    | CR (e) | CR overlap        | CR-KIM Field | CR total |                                                |
| 03-JR-MA-006  | 116       | 500    | 84                | 3            | 87       | 375                                            |
| 03-JR-MA-022  | 66        | 100    | 50                | 4            | 54       | 82                                             |
| 03-JR-MA-024  | 85        | 800    | 82                | 2            | 84       | 791                                            |
| 03-JR-MA-025  | 83        | 5000   | 63                | 2            | 65       | 3916                                           |
| 03-JR-MA-028  | 45        | 70     | 40                | 1            | 41       | 64                                             |
| 03-JR-MA-029  | 85        | 200    | 78                | 3            | 81       | 191                                            |
| 03-JR-MA-031  | 35        | 60     | 30                | 1            | 31       | 53                                             |
| 03-JR-MA-033  | 80        | 120    | 71                | 0            | 71       | 107                                            |
| 03-JR-MA-041  | 61        | 100    | 53                | 0            | 53       | 87                                             |
| 03-JR-MA-042  | 25        | 50     | 22                | 0            | 22       | 44                                             |
| 03-JR-MA-043  | 93        | 300    | 86                | 3            | 89       | 287                                            |
| 03-JR-MA-044  | 61        | 100    | 47                | 0            | 47       | 77                                             |
| 03-JR-MA-047  | 20        | 50     | 19                | 0            | 19       | 48                                             |
| 03-JR-MA-096  | 21        | 40     | 18                | 0            | 18       | 34                                             |
| 03-JR-MA-110  | 73        | 300    | 63                | 5            | 68       | 279                                            |
| 03-JR-MA-134  | 112       | 300    | 101               | 4            | 105      | 281                                            |
| 03-JR-MA-138  | 166       | 7000   | 161               | 4            | 165      | 6958                                           |
| 03-JR-MA-140  | 61        | 400    | 56                | 1            | 57       | 374                                            |
| 03-JR-MA-142  | 31        | 50     | 27                | 2            | 29       | 47                                             |
| 03-JR-MA-144  | 107       | 2000   | 102               | 2            | 104      | 1944                                           |
| 03-JR-MA-145  | 47        | 70     | 45                | 1            | 46       | 69                                             |
| 03-JR-MA-148  | 31        | 60     | 29                | 0            | 29       | 56                                             |
| 03-JR-MA-149  | 51        | 500    | 45                | 4            | 49       | 480                                            |
| 03-JR-MA-151  | 27        | 70     | 25                | 0            | 25       | 65                                             |
| 03-JR-MA-154  | 31        | 60     | 27                | 0            | 27       | 52                                             |
| 03-JR-MA-158  | 30        | 60     | 29                | 1            | 30       | 60                                             |
| 03-JR-MA-162  | 24        | 40     | 24                | 0            | 24       | 40                                             |
| 03-JR-MA-169  | 46        | 1000   | 44                | 1            | 45       | 978                                            |
| 03-JR-MA-171  | 40        | 120    | 33                | 1            | 34       | 102                                            |
| 03-JR-MA-173  | 52        | 300    | 47                | 1            | 48       | 277                                            |
| 03-JR-MA-174  | 53        | 150    | 49                | 2            | 51       | 144                                            |
| 03-JR-MA-177  | 30        | 60     | 28                | 2            | 30       | 60                                             |
| 03-JR-MA-178  | 57        | 200    | 55                | 1            | 56       | 196                                            |
| 03-JR-MA-180  | 32        | 80     | 32                | 0            | 32       | 80                                             |
| 03-JR-MA-183  | 35        | 80     | 34                | 0            | 34       | 78                                             |
| 03-JR-MA-185  | 140       | 600    | 136               | 2            | 138      | 591                                            |
| 03-JR-MA-188  | 35        | 125    | 34                | 0            | 34       | 121                                            |
| 03-JR-MA-192  | 30        | 50     | 25                | 1            | 26       | 43                                             |
| 03-JR-MA-195  | 13        | 30     | 6                 | 0            | 6        | 14                                             |
| 03-JR-MA-197  | 40        | 80     | 33                | 1            | 34       | 68                                             |
| 03-JR-MA-199  | 33        | 500    | 26                | 4            | 30       | 455                                            |
| 03-JR-MA-201  | 36        | 150    | 33                | 0            | 33       | 138                                            |
| 03-JR-MA-210  | 21        | 50     | 20                | 0            | 20       | 48                                             |
| 03-JR-MA-218  | 58        | 150    | 57                | 1            | 58       | 150                                            |
| 03-JR-MA-219  | 25        | 50     | 22                | 0            | 22       | 44                                             |
| 03-JR-MA-220  | 50        | 80     | 44                | 1            | 45       | 72                                             |
| 03-JR-MA-222  | 21        | 150    | 21                | 0            | 21       | 150                                            |
| 03-JR-MA-223  | 16        | 25     | 18                | 0            | 18       | 28                                             |
| 03-JR-MA-230  | 21        | 40     | 20                | 0            | 20       | 38                                             |
| 03-JR-MA-232  | 21        | 80     | 18                | 0            | 18       | 69                                             |
| 03-JR-MA-237  | 20        | 40     | 18                | 1            | 19       | 38                                             |
| 03-JR-MA-240  | 27        | 40     | 24                | 1            | 25       | 37                                             |
| 03-JR-MA-241  | 42        | 200    | 35                | 3            | 38       | 181                                            |
| 03-JR-MA-243  | 21        | 50     | 19                | 2            | 21       | 50                                             |
| 03-JR-MA-249  | 50        | 150    | 46                | 2            | 48       | 144                                            |
| 03-JR-MA-254  | 50        | 100    | 45                | 3            | 48       | 96                                             |
| 03-JR-MA-262  | 50        | 70     | 47                | 1            | 48       | 67                                             |
| 03-JR-MA-264  | 30        | 50     | 28                | 1            | 29       | 48                                             |
| 03-JR-MA-266  | 32        | 50     | 27                | 0            | 27       | 42                                             |
| 03-JR-MA-275  | 51        | 100    | 50                | 1            | 51       | 100                                            |

| Sample Number | KIM Count |        | Total KIMs Probed |              |          | picked estimate<br>normalization |
|---------------|-----------|--------|-------------------|--------------|----------|----------------------------------|
|               | CR (p)    | CR (e) | CR overlap        | CR-KIM Field | CR total | tot KIM CR                       |
| 03-JR-MA-276  | 23        | 50     | 20                | 0            | 20       | 43                               |
| 03-JR-MA-279  | 20        | 40     | 18                | 0            | 18       | 36                               |
| 03-JR-MA-287  | 23        | 60     | 23                | 0            | 23       | 60                               |
| 03-JR-MA-290  | 50        | 500    | 49                | 0            | 49       | 490                              |
| 03-JR-MA-291  | 30        | 70     | 25                | 0            | 25       | 58                               |
| 03-JR-MA-292  | 24        | 1000   | 20                | 1            | 21       | 875                              |
| 03-JR-MA-294  | 35        | 200    | 35                | 1            | 36       | 206                              |
| 03-JR-MA-296  | 39        | 1000   | 36                | 0            | 36       | 923                              |
| 03-JR-MA-298  | 74        | 1000   | 70                | 2            | 72       | 973                              |
| 03-JR-MA-300  | 20        | 200    | 20                | 0            | 20       | 200                              |
| 03-JR-MA-302  | 21        | 40     | 18                | 2            | 20       | 38                               |
| 03-JR-MA-304  | 20        | 80     | 18                | 1            | 19       | 76                               |
| 03-JR-MA-309  | 70        | 800    | 65                | 2            | 67       | 766                              |
| 03-JR-MA-310  | 20        | 300    | 17                | 0            | 17       | 255                              |
| 03-JR-MA-314  | 50        | 100    | 49                | 1            | 50       | 100                              |
| 03-JR-MA-316  | 20        | 60     | 18                | 0            | 18       | 54                               |
| 03-JR-MA-317  | 51        | 50     | 49                | 1            | 50       | 49                               |
| 03-JR-BD-008  | 44        | 250    | 42                | 1            | 43       | 244                              |
| 03-JR-BD-009  | 79        | 1000   | 74                | 1            | 75       | 949                              |
| 03-JR-BD-010  | 25        | 50     | 23                | 0            | 23       | 46                               |
| 03-JR-BD-012  | 35        | 200    | 34                | 1            | 35       | 200                              |
| 03-JR-SG-010  | 107       | 300    | 98                | 4            | 102      | 286                              |
| 03-JR-SG-011  | 24        | 150    | 24                | 0            | 24       | 150                              |
| 03-JR-SG-013  | 24        | 150    | 19                | 0            | 19       | 119                              |
| 03-JR-SG-015  | 40        | 100    | 36                | 1            | 37       | 93                               |
| 03-JR-SG-016  | 60        | 120    | 58                | 1            | 59       | 118                              |
| 03-JR-SG-022  | 24        | 40     | 16                | 0            | 16       | 27                               |
| 03-JR-TM-001  | 40        | 150    | 37                | 1            | 38       | 143                              |
| 03-JR-TM-002  | 23        | 150    | 18                | 0            | 18       | 117                              |
| 03-JR-TM-004  | 41        | 80     | 29                | 0            | 29       | 57                               |
| 03-JR-TM-005  | 60        | 100    | 52                | 1            | 53       | 88                               |
| 03-JR-TM-006  | 41        | 80     | 38                | 2            | 40       | 78                               |

# Metric Conversion Table

| Conversion from SI to Imperial |               |                              | Conversion from Imperial to SI |                       |                 |
|--------------------------------|---------------|------------------------------|--------------------------------|-----------------------|-----------------|
| SI Unit                        | Multiplied by | Gives                        | Imperial Unit                  | Multiplied by         | Gives           |
| LENGTH                         |               |                              |                                |                       |                 |
| 1 mm                           | 0.039 37      | inches                       | 1 inch                         | <b>25.4</b>           | mm              |
| 1 cm                           | 0.393 70      | inches                       | 1 inch                         | <b>2.54</b>           | cm              |
| 1 m                            | 3.280 84      | feet                         | 1 foot                         | <b>0.304 8</b>        | m               |
| 1 m                            | 0.049 709     | chains                       | 1 chain                        | 20.116 8              | m               |
| 1 km                           | 0.621 371     | miles (statute)              | 1 mile (statute)               | <b>1.609 344</b>      | km              |
| AREA                           |               |                              |                                |                       |                 |
| 1 cm <sup>2</sup>              | 0.155 0       | square inches                | 1 square inch                  | <b>6.451 6</b>        | cm <sup>2</sup> |
| 1 m <sup>2</sup>               | 10.763 9      | square feet                  | 1 square foot                  | <b>0.092 903 04</b>   | m <sup>2</sup>  |
| 1 km <sup>2</sup>              | 0.386 10      | square miles                 | 1 square mile                  | 2.589 988             | km <sup>2</sup> |
| 1 ha                           | 2.471 054     | acres                        | 1 acre                         | 0.404 685 6           | ha              |
| VOLUME                         |               |                              |                                |                       |                 |
| 1 cm <sup>3</sup>              | 0.061 023     | cubic inches                 | 1 cubic inch                   | <b>16.387 064</b>     | cm <sup>3</sup> |
| 1 m <sup>3</sup>               | 35.314 7      | cubic feet                   | 1 cubic foot                   | 0.028 316 85          | m <sup>3</sup>  |
| 1 m <sup>3</sup>               | 1.307 951     | cubic yards                  | 1 cubic yard                   | 0.764 554 86          | m <sup>3</sup>  |
| CAPACITY                       |               |                              |                                |                       |                 |
| 1 L                            | 1.759 755     | pints                        | 1 pint                         | 0.568 261             | L               |
| 1 L                            | 0.879 877     | quarts                       | 1 quart                        | 1.136 522             | L               |
| 1 L                            | 0.219 969     | gallons                      | 1 gallon                       | <b>4.546 090</b>      | L               |
| MASS                           |               |                              |                                |                       |                 |
| 1 g                            | 0.035 273 962 | ounces (avdp)                | 1 ounce (avdp)                 | 28.349 523            | g               |
| 1 g                            | 0.032 150 747 | ounces (troy)                | 1 ounce (troy)                 | <b>31.103 476 8</b>   | g               |
| 1 kg                           | 2.204 622 6   | pounds (avdp)                | 1 pound (avdp)                 | <b>0.453 592 37</b>   | kg              |
| 1 kg                           | 0.001 102 3   | tons (short)                 | 1 ton (short)                  | <b>907.184 74</b>     | kg              |
| 1 t                            | 1.102 311 3   | tons (short)                 | 1 ton (short)                  | <b>0.907 184 74</b>   | t               |
| 1 kg                           | 0.000 984 21  | tons (long)                  | 1 ton (long)                   | <b>1016.046 908 8</b> | kg              |
| 1 t                            | 0.984 206 5   | tons (long)                  | 1 ton (long)                   | <b>1.016 046 90</b>   | t               |
| CONCENTRATION                  |               |                              |                                |                       |                 |
| 1 g/t                          | 0.029 166 6   | ounce (troy)/<br>ton (short) | 1 ounce (troy)/<br>ton (short) | 34.285 714 2          | g/t             |
| 1 g/t                          | 0.583 333 33  | pennyweights/<br>ton (short) | 1 pennyweight/<br>ton (short)  | 1.714 285 7           | g/t             |

## OTHER USEFUL CONVERSION FACTORS

|                                | Multiplied by |                               |
|--------------------------------|---------------|-------------------------------|
| 1 ounce (troy) per ton (short) | 31.103 477    | grams per ton (short)         |
| 1 gram per ton (short)         | 0.032 151     | ounces (troy) per ton (short) |
| 1 ounce (troy) per ton (short) | 20.0          | pennyweights per ton (short)  |
| 1 pennyweight per ton (short)  | 0.05          | ounces (troy) per ton (short) |

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.





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**OVERSIZE MAP  
NOT FILMED**

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